CQ, The Radio Amateurs' Journal

June 1957
Vol. 13, No. 6

Feature Articles

CQ'S VHF Party .... *Engene H. Hastings, W1VRK* 27
Boy, are our contests fun!

DSB Adapter .... *John K. Webb, W0AHM* 30
Does 1/c job of detecting anything, particularly DSB

Confusion Compounded .... *Charles W. Kram, W5TFZ* 34
All the characters and events are fictitious, any similarity, etc. . . .

Shoes for the 10-B .... *E. H. Sommerfield, W2UQB* 36
Now you can be as loud as he is

QSL's .... *F. D. Whitmore, W2AAA* 38
Rather complete design discussion, #2 of a series

Remote Tuned Mobile Rig .... *F. A. Bartlett, W6OWP* 44
ARC-5 plus Reference-Shift modulator

Project Conelrad .... *Joseph E. Howell, W9CKP* 49
see Feb. 1957 CQ page 14

Circuit Quiz .... *Autocall* 50
Brain addler "borrowed" from "Autocall"

500kc Standard .... *Frank H. Tooker, W2VQL* 52
In case you want to build one of these, here's how

Printed Circuits, part III .... *E. L. Klien, W4UHN* 56
Xtal filter to make SSB out of AM

DX Contest Results-CW .... *Frank Anzalone, W1WY* 67
Here's the scores for last November's contest

Departments

Scratchi 7
de W2NSD 10
Letters 14
Contest Calendar 16
QSL Contest 22
Puzzler 24
Surplus 61
Propagation 72
SB 74
YL 78
DX 82
VHF 88
Novice 92
RTTY 100

Miscellaneous

Hamfest Calendar 20
New Products 94

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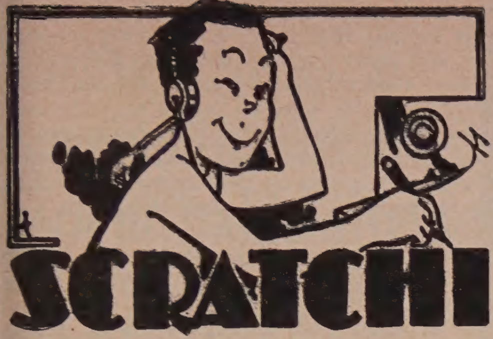

Feenix, Ariz.

Deer Hon. Ed:

Good old Feenix. Good old Hon. State of Arizona. Whooee!! am I glad to be back from Callyfornia. Boy oh boy, Hon. Ed., were those peeples mad at me—not that they could doing anythings about it, on acct. it are most pecuelar sityouayshun. But what a mess, what a mess.

Letting me explaneing history behinds all this so you can reely appreciating hole think. Some time ago lotsa my friends here in Feenix are getting fancy garage door openers what working by having little xmitter in there car. When they coming to garage and wanting doors open, they turning on little xmitter and rf signal going to reseever in garage and relay clicking and motor starting and doors opening.

These are all working so reel slicky Scratchi desiding to having sum fun, so I getting little xmitter in my car what operating on same freakwency—27.255 mc. You understanding, Hon. Ed., this are all perfectly legal, on acct. this freakwency are remote control freakwency and anybuddies can working on it.

Wunce Scratchi getting set, are having 1/c time of it. Are driving around and parking in front of friends house and making garage door going up and downs like crazy. Or, if driving by friends house, and seeing door up, I making it going down, or verse-visa.

Everything still be working peechy and I be having lotsa fun yet except that Hon. Friends are getting mad and fixing it up so I not being able to working garage doors. You know what they doing, Hon. Ed? They rewiring door openers so they only working when they modulayting the rf with awdio tone.

Not only that, they getting reel sneeky. Each one are arranging so it using diffrunt awdio tone!! That meening if Scratchi going to keep on having his fun, I are having to getting rf xmitter in car I can modulayting with lotsa diffrunt awdio tones.

At first I trying to doing this by whistling in mike, but are too many diffrunt tones and I never gettng rite one to operating garage-door control. Howsumever, Scratchi are not licked. No indeedy. If what I needing are xmitter on 27.255 mc. what can be modulayted with lotsa diffrunt awdio tones, then that

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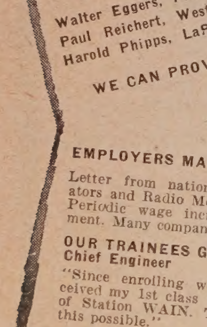
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what I getting. Yes indeedy.

He seeing, Hon. Ed., I are having frien what reel expert at this stuff. He living ove in Hon. City of Los Angelees, and he felle what doing lotsa work on model airplane control. I calling him on land-line and he sayin he being happy to helping, and why not I driving over. So, seeing as how it are vaycayshu time, I hopping in car and driving to Lo Angelees.

This friend feller are having place out nee airport, rite off big mane hiway. When I getting there, he taking look at xmitter in my car going in shop and coming out with gadge which can producing almost any old tone can wanting, and in practikally no time he ar wiring it up to xmtter. He telling me to goin ahead and trying it out and seeing if awdi tones are okey.

So, I setting up testing device, turning o car motor to making sure battery okey, an starting to test all the diffrunt awdio tones Few minutes later are getting harder to hee the awdio tones on acct. eleventeen thousan cars are all making with there horns. Evidentl are 1/c traffic jam on road leeding to airpor

Few minutes later I still testing awdio tone and few minutes later traffic jam are gettin even worse. Horns are blowing, poleece syren are blowing, peoples are yelling—a reel craz mixed-up mess, Hon. Ed. What a racket!!

I are just about finished testing, and are ha ing Hon. Head stuck under dash fixing cupp conneckshuns, when I heering syrens gettin lowder and lowder, and first thing I kno someone saying "This must be the guy." looking up, and there are fellow with ea fones on head and cupple cops from loc poleece stayshun just staring at me. Next thi I knowing I are yanked out of car, whisk into poleece car, and all the time those co are yelling something about malishus misch and interfeering with traffic lites, and so on.

You knowing what happening?? Los Ang lees are having traffic lites what are being co trolled by radio, and they using freakwen of 27.255 kc. just likesame amchoors a model control peeples. That big traffic ja are on acct. Scratchi are sending tones to li and they going all red all times so cars n getting by.

Feller with earfones are local FCC m who helping find trubble for poleece, and th tracing sigs to me. When getting to pole stayshun not having any trubble when planeing what I are doing, but I can't say everybuddys are reel happy about the sity ayshun.

Hon. Ed., howcomes big city like that h ing to use selfsame freakwency like evrybud else? Maybe we can riting to our Hon. C gressman and giving him reel lowdown fa Of course, if doing that, and they chang freakwency, then Scratchi can't changing l

[*Continued on page 116*]

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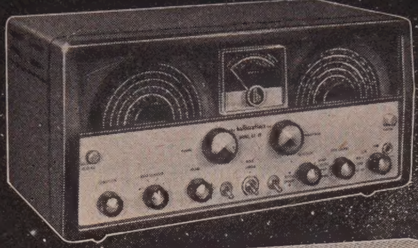

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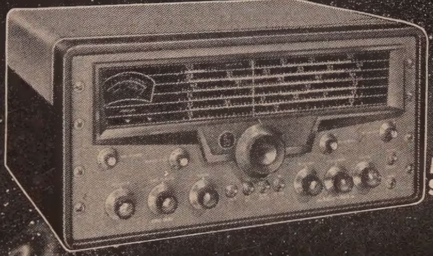

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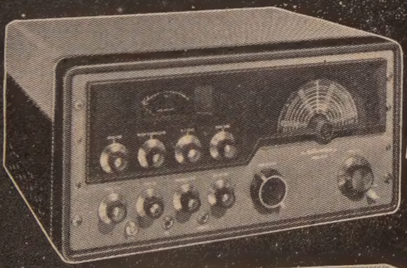

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EDITORAL . . .
WAYNE GREEN

. . . de W2NSD

NEVER SAY DIE

Docket 11994

If you haven't heard about this one yet then you have indeed been out of touch with things. It seems that the FCC is giving us until June 10th to write them and explain why we think we should keep eleven meters. The proposal up before us, gentlemen, is for the eleven meter band to be turned over to Citizens' Radio service. They are not specific as to what would replace the amateur activity there, but a mention is made that the Academy of Model Aeronautics is involved in the move.

My first reaction when I read the proposal was that if we have to lose a band then eleven is probably the best one to lose. But on the other hand, once something like that goes we will never get it back again, no matter how badly it may be needed. A lot of us have been on there at one time or another, but the average activity is so slight that it is no wonder that someone else asked for it.

Maybe we could make a deal? The docket doesn't offer us anything in swap for the band . . . maybe if we kicked up a fuss we could trade for something else. But after looking over the spectrum charts I gloomily gave up on that idea . . . there doesn't seem to be anything left to trade for.

As I pondered this thing and talked it out on the air I began to see that we might be making a really big mistake in letting eleven get away from us. I'll admit that we aren't using it now, but a lot of the fault in that lies on the doorstep of CQ and QST since we haven't made any fuss over eleven and tried to get activity going there. I did expand the CQ DX Contest to count eleven as a separate band with that idea in mind, but that is about all I can take credit for. It still isn't too late on this score, as I'll explain later.

Let's look at some of the reasons why we should keep eleven. First, suppose that some group had tried to get ten meters from us back in 1935. On the basis of activity we had absolutely no claim to the band. There were a few experimenters working on those VHF's, but real activity didn't fill out the band until after the war. Our ham ranks today are filling at an unprecedented rate and we may well have five or ten times as many amateurs in just a few years as we have right now. Will eleven be important then? And how!

There are other benefits too. Eleven is the only long range band where we can under present regulations transmit facsimile. If any commercial fax equipment ever gets into ham hands we will have hundreds of ham fax stations busting to get on the air and no place for them to operate. The legality of dead carriers on this band also makes it desirable to those experimenters who want to run propagation tests. Duplex operation, which even beats voice-control break-in for enjoyable operating, is not permitted on any other band below 51 mc. This holds particularly now that most of the voice-control operators have developed their breath control to the point where they can make ten minute transmissions without a pause for anyone else to get a word in edgewise. Those old 160 meter ops will remember with strong nostalgia the vast duplex roundtables that would build up on Sunday afternoons. And I've probably not even thought of the one really important use that we will have for the band once it is gone.

What Can We Do

I don't know what the ARRL intends to d about this situation, however I expect that the will file a brief of some sort, pro or con an sit back to see what happens. This may, i they decide to try to oppose the proposal, d the trick. And it might not. Just to be saf I am going to do as the FCC suggests and wri them (in triplicate) my views, pointing out tha I believe that the eleven meter band shoul be left as it is now, an amateur band. I woul strongly suggest that you take out the nece sary time to do the same thing. If we can g a few thousand letters into the FCC telling 'e that we really want that band then we ma stand a chance of stopping this first of mar bites into our bands. If you have a secretar dictate a letter right away. If you have a frie get him to write a letter. When you get on t air push everyone you talk to to write als Let's really pile in those letters to the F.C. Washington 25, D.C.

But letters might not do the whole thing think that if we could demonstrate that we c occupy that band that we might have an ev stronger argument in our favor. So here what we'll do.

June 8-9 Eleven Meter Contest

June 8th and 9th are the BIG days. Anyo who can fire up on eleven absolutely *m* get on the band on that weekend. If you not on it at present you can throw up a fol

[*Continued on page 106*]

Dick that he should make his career in a field related to electrical technology.

Postwar Education. Discharged with the rank of Staff Sergeant, Dick returned home to marry a girl he had met at Lehigh. During this period, he successfully supported his family selling various lines of food. In the evening, however, Dick continued his study of radio, TV, and electronics at the Allentown Branch of the Temple Institute. In two years' time, he graduated and secured an F.C.C. license —his technical career began to take shape.

IBM Looks Especially Good. Glancing through an issue of *Time Magazine* one evening, Dick happened to read an article about Thomas J. Watson, Jr., the president of IBM. The story emphasized Mr. Watson's great faith in the future of electronic computers . . . the wonderful promise it holds for the ambitious, intelligent young man. Later, Dick spotted a classified ad describing IBM's association with Project Sage. That was all Dick Brani needed.

Asked to Become an Instructor. Three-quarters of the way through his nine-month computer systems course, Dick was invited to remain at Kingston as an instructor. "It was like a bolt out of the blue," he recalls. "I knew I'd enjoy teaching, but I always thought it was out of the question. I accepted all right. I can't tell you how much I've enjoyed helping these fellows and watching them grow within the organization. Right now, there's a fellow in my class whose education is limited to correspondence school. He's in the top third of his class, and has a real future with IBM—all because he has the native talent and is willing to work."

What Does Dick Brani Teach? "Actually, I teach three separate courses in field engineering. One is computer systems testing, which is for the more advanced student. It lasts for 33 weeks—a long time, perhaps, but it's well worth it. Another is a program of 24 weeks' duration that deals with computer input-output units. Finally, I teach a course in computer units displays. This also lasts for 24 weeks. Each one of these courses is an education in itself." Experience has shown that IBM's educational programming is most successful. Men accepted receive their training with no strings attached. Upon graduation the road to success is wide open in *all* divisions of the corporation.

What About Dick's Future? "Well, right now, I'm doing work that most technicians couldn't touch with a ten-foot pole. I guess it's a matter of approach, but I know of few companies other than IBM where technicians are actually doing engineering work. Both kinds of companies will get the job done, but IBM prefers to think in terms of the man, encouraging him to grow into more responsibility. You might say that IBM gets more out of the man. In the final analysis, it seems a lot more efficient from the corporation's and employee's viewpoint. Personnel policy at all levels—management, engineering, or technical—is the same. The future is wide open."

What About You? Permanent opportunities in the nationally important Project Sage program are still growing. If IBM considers your experience equivalent to an E.E., M.E. or Physics degree, you'll receive 8 months' training, valued at many thousands of dollars as a Computer Systems Engineer. If you have 2 years' technical schooling or the equivalent experience, you'll receive 6 months' training as a Computer Units Field Engineer, with opportunity to assume full engineering responsibility. *Assignment in area of your choice.* For more information, please write to: Nelson Heyer, Dept. 12706, IBM, Kingston, New York. You'll receive a prompt reply.

Dick explains computer logic to a Systems Class.

At the Operating Console.

At home Dick plays with one of his three children.

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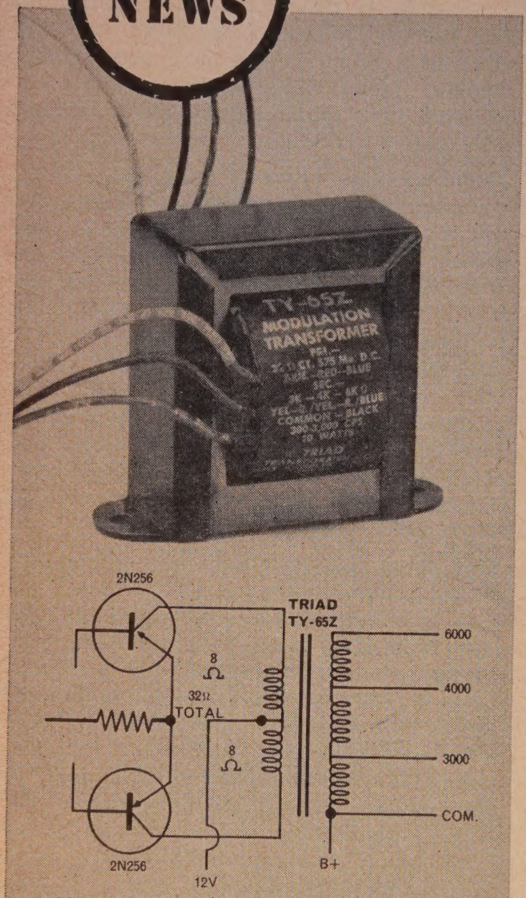

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For further information, check number 12 on page 126.

Letters . . . to the editor

Novice LFO Correction

Dear Wayne,

Resistor R7 (Novice LFO, page 120 April CQ) is not a Bolar R77Q-1. R77Q-1 is not a humidity compensating type and is an ordinary 6½ watt carbon. The type obviously referred to is Bolar R75Q-1.

Merritt Fiske W9QMB
Beloit, Wisconsin

CQ K4HQB ES gang:

TNX VY much FR the INFO on the Novice LFO. Copied U solid OM, U sure swished the old VFO across those Snob Hill Electronicrats over at PSQ.

Us unshaven boys over here on the Left side of the Hall really dig UR Steppe by Steppe instructions and what's more, the LFO worked the first time we plugged it in.

Somewhere in the QRM we kind of missed just what the darn thing is supposed to do, but who the Hell cares, as long as it works FB!

It obliterated channels 2 to 78 incl. at first but we soon fixed that by substituting a low Pu for the high Pu tube called for and got no more complaints except from some YL marathon swimmer who said our out put landed smack in the middle of the English Channel which she was trying to get from some place to another place in. We sent her a standing wave bridge and no one has heard from her since, so I guess everything is OK now.

So TNX AGN OM and how about an article on a Pu multiplier for the LFO?

de K2HTG
Box 584
Jamestown, N. Y.

Dear Wayne,

Thank you for publishing my article on the Novice LFO. I have received five fan letters for which I am grateful. I don't ever remember having pleased anybody before. Due to this, I am in the process of designing a companion piece for the LFO. If it turns out as I expect, the two units, working together, will put out a signal the likes of which has never been heard before. If you would like to see it when I finish, I will gladly send it to you.

In addition to the letters, I received two gifts from two of the best known designers of amateur equipment in the country. I was truly humbled by their interest. Since I do not approve of name dropping, I will omit their names.

One of the gifts was a small jar of condiments. I can't understand how he found out I was an amateur cook. The condiment seems to be an extremely concentrated almond extract. It has a rather bitter almond odor. However, the accompanying letter says it is not to be diluted. I shall try it at the first opportunity.

The other gift appears to be a new type of transistor, probably an experimental type. I have heard of the P-N-P and N-P-N transistors, but this box is marked T-N-T. It must be extremely fragile, considering the size of the box and the fact that it is secured with several turns of wire. I'll have to cut it with these diagonals. I've been so busy up to now I haven't had a chance to op. . . .

J. G. David K4HQB
Bishopville, S.C.

Dear Wayne:

Ever since reading your article on the beer can vertical, I had been tempted to make one. So, I ordered a supply of the cans from a local emporuim and, while waiting for delivery, got all of my tools laid out and ready to go.

[*Continued on page 16*]

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With a fully charged battery, the "Sportsman" will provide the following services without battery recharge:

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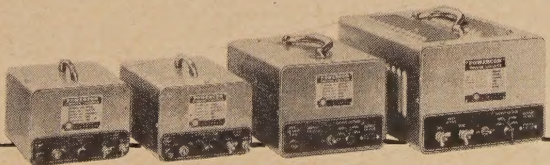
STANDARD POWERCONS: 6VDC - 110VAC, 20-150 WATTS; 12VDC - 110VAC, 20 - 250 WATTS. SELF - REGULATING SINE - WAVE MODELS AVAILABLE



CORNELL-DUBILIER POWERCONS

For further information, check number 13 on page 126.

POSITIVE BAND CHANGE in an INSTANT

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MANUAL MOBILE ANTENNA

- Locks on the band
- Indexed Band Indicator . . . no guessing
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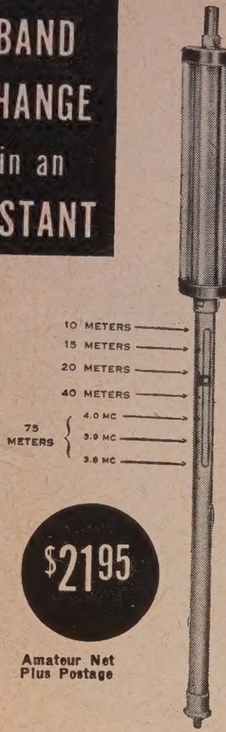

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AUTENNA Tunes Amateur Bands
75-40-20-15-10 Meters

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- Positive Noise Free Silver Plated Contacts.
- Installed or Removed in Seconds with Kwik-On Connectors for Trunk Storage.
- Will handle up to 100 Watts
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Designed for use with 60" whip. Complete with two Kwik-On Connectors, Whip Flexor Spring and Indicator Network. Special offer for a limited time includes meter and control panel at no extra charge.

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Representatives Wanted
A few choice areas on the East Coast still available. Write for details.

For further information, check number 14 on page 126.

Well, the truck arrived a short while ago, unloaded th cans and here I am surrounded with my beer can antenna in the rough. The first thing I'll have to do is t prepare some cans for assembly, which means that I'l have to remove the contents therefrom. Sure wish you were here to help me on this job. But, I'd better get o with it or it will never get finished.

I just emptied three of the cans and thought I'd write a little more before going on. However, right now I'm beginning to feel a little different from before. It's funny how a cold drink can warm your stomach up and inspire your thoughts, inn's it? I can jiss see that verticle stretchink up in thewild blu yunder. I mush be gettig back on the jub againn.

Wall, that's six umpties now, and menny morx to go. I must have been sittign to close to the firee for I started tew feel a littet dizzy. Better empte a vew morre. There, my head feels as clare as a bell agin/ Bud I must not take tu lonrg onthe job, so bacck tow ork.

Boy, thish sure is goig tu be a wunnerfull atenna. Allthose gleming cans standinx strait up int he airr. I can herdly wate to get it dun. I'v countedt he canns sizx tims now butt I dount alweys cum out wid th esame numberr. Must beat leest 12 or 10 ther elready; thers stil mor to go. I tinx.k

Say, tis amtenna bildig isall righr. Im for it 100#%. Itl ooks like I'l nevar getdon thiz evning. Theres sims to bee mor andmore canz leeft than whatx I startedt wit.

Looks asth ough Ill be her alln ight gettg the cans rea dy. Buth wate, ther mush bex somethin rong wid my mi meth od. Bi gully, I sur wish hthat thise cans wud qwuet muving arund. Icanx hard ly keap trackx of the emxties.

Now I likx litel dring onceina while speshully whex constrxtig sumthig lik theese. Them ore I dring oft his stuf them ore it luks likx ill notx bea ble tu finx thize cukkee cutterxs tonitx. Budr its ure goxd tube ablx tox drig tuyo ur healtg.

Zincferlez, yuors,
James E. Brugh W3ZUW
Pittsburgh, Pa.

Dear Wayne:

Have used MK II as K6BGD/AF6BGD and now W7YRG/AF6BGD fixed, portable and mobile. It has also been used by XYL K6GTN now W7YRI and young ops K6GOO and K6GOP now W7YRH and W7YRJ.

Will be glad to assist in saving any and all MK II rigs from such a watery grave. Have two on the air now and could use more.

R. Wm. Lindberg
Phoenix, Arizona

Gentlemen:

Why don't you pick some enterprising ham supplier and furnish him with "proofs" for your construction articles ahead of time so he could advertise a complete set of parts to complete it? Might amount to something, might not. Kick it around.

Jack W5DAU
Hobbs, New Mexico

Guess we could do that if any supplier was interested.

Dear OM:

I would like to make a short report on ham activity during the run of my 33 foot cruiser down the inland water-way from Annapolis, Md., to Sarasota, Florida.

"We were so damned busy keeping the boat going we never got on the air."

Larry Felton, K4BJ
St. Petersburg, Fla.

Honorable CQ Editor:

Ref: March 1957 CQ Magazine and the general subject Double Sideband less Carrier.

As a single sideband operator of some few years (since May 1952) I must register my opinion of double sideband suppressed carrier (hoping you will print same in your letters to editor next month).

I think that DSB less carrier is one of the greatest things to be introduced to the Amateur Radio art during the past few years and as one of Tennessee's first SSB operators I endorse this means of transmission and will

[Continued on page 110]

How CQ's VHF Party can affect 3 otherwise healthy hams

Eugene H. Hastings, W1VRK
28 Forest Ave.,
Swampscott, Mass.

First thing I know I get a phone call from Fred, W1HLP (Fred from Marblehead) with the question: "Want to go up on a mountain on the VHF party?" "What VHF party?," I said. (Fred always gets his *CQ* earlier than anybody). "*CQ*'s VHF party is in August. Want to have some fun?"

"Bob (W1KTJ) and Bill (W1YQI) will loan us rigs, I've got a linear for two, Stew (W1PSF) will loan us his 2KW generator, I have a trailer, and I just bought a *Skysweeper* 5-over-5 (the seven-over-seven was out of stock) and I've found where you can get that 6 meter beam you've been talking about wanting to get and . . ." Well, that did it. I *couldn't* say no! He had everything for the trip except coax—and he reminded me that I had 300 feet of RG-8-U not in use at present.

Where to go? Several low-frequency boys had suggestions. We finally decided on Mt. Agamenticus, York, Maine, as there is a road to the top, and a few remaining shacks there courtesy of World War II and the Signal Corps. Fred preferred Mt. Chicorua, N. H., but I did not like the idea of hiking up 4 miles with all that equipment on my back. Actually, I did not like the idea of hiking 4 miles, period.

When Saturday rolled around I chased all over the house for gear. I tried to think of everything. Let's see . . . screwdrivers, pliers, longnoses, wire snips, wire strippers, U-bolts, solder gun, solder, hook-up wire, extra coax connectors, a knife switch, and wrenches. Just in case, I'd better take an extra 150′ of rotator cable and Gib's (W1UGA) TR-2 rotator.

The SX-71 will give better selectivity on 6 if we should need it (we did). Oops! Almost forgot the paper bag with the beam hardware. That would never do. Fred's station wagon was already filled to the brim. I had yet to pack the folding chairs, card table, picnic cooler, lunch boxes, gasoline can and the beam (dis-assembled).

Departure

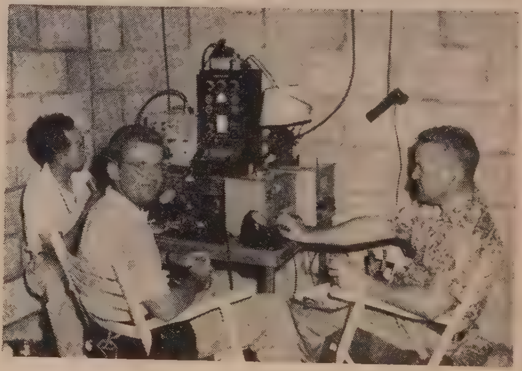
Fred and I started from Swampscott at about 10 o'clock and arrived at Mt. Agamenticus before noon. Eddie, W1CUO, the third op, was to join us later. Luck was with us—we did not arrive to find another amateur encampment already in progress. Fred parked the car and we went up the fire tower to greet the fire warden. One of the things he mentioned was that everything was very dry and that it never rained up there. (Remember this.) Fred and I unpacked the caravan in about 90° heat and started to set up the stations. A little cement-block shack used by the signal corps during the war as an ammunition depot, seemed to be a bit cooler inside. We moved in. The 6 meter beam, a *Gonset,* went together rather easily, but in putting it up the shape of the elements was altered by two stubborn telephone wires. Immediately following this argument with the Bell system I heard the phone ring in the watchman's tower so I guess the conductive quality of aluminum when placed across two bare phone wires was thoroughly proven.

In the meanwhile Fred had assembled his 5-over-5 on the mast and was ready to hoist it to the roof. (You should have seen Fred getting up to the roof! Wish I had had my camera handy!!) The installation required quick guying. Fred sweated this out, hoping that the future of his new array would not be suddenly ended.

I could hardly wait to set up the station and try out our luck—even though the starting time of the contest was eight hours away! We pushed a pile of old bottles, bricks, and lumber out of the way in the house and set up the table. It got wiggly as we put on the SX-71, the TBS-50, the *Gonset* 6, the *Gonset* 2, the *Gonset* Linear, the two rotator indicators, microphones and miscellaneous stuff. "Gene, did you bring the power cord?" I started to wonder for a minute, but I found it under the rolls of coax and rotator cable, after I had removed Fred's sleeping bag and coke cooler. I hooked up the cable and started the generator with a piece of clothesline (Fred couldn't find the starter rope). A 12′ length of rusty iron pipe over the exhaust outlet and an old metal roof cover in the shape of a tent over the end of the pipe to direct the sound away from the shack reduced the noise. Since we had left the flexible pouring spout for the 5 gallon army gas can home we had to refill the generator cup by cup. Ugh!

My first contact was with W1SPL/1 in New Hampshire. It was decided that Fred would operate on Two and I would operate on Six. W1SPL/1 had a fairly good signal so I asked about his antenna. He was loading up a TV antenna. These VHF men! Now, six hours to go—not as long as we thought—for we had gotten quite thirsty and rather hungry. A bit of time was consumed thinking out what we would eat and what we should save. The ice seemed to be melting rather fast, too.

Around 5 o'clock we had our first visitor. It was George, W1LBJ, from Berwick, Maine. He had heard us testing and decided to come up and pay us a visit. George was a very nice fellow, for not only did he give us a few pointers on operating from our portable location, but came back later in the evening with fresh water and a whole bucket of ice cubes! Good ol' George!



Left to right: Ed, W1CUO; Gene, W1VRK; Fred, W1HLP. In the shack on the mountain. Time exposure, not as crisp but more flattering.

Seven o'clock arrived and so did two more hams—their car loaded with equipment! Seems as how they too had planned to use Mt. Agamenticus for the *CQ* VHF party and had used it so often before that they had not imagined anyone else (let alone men from Massachusetts!) dragging VHF gear up there on a hot summer day! Charlie, W1KID and Bill, W1AHE, decided not to stay and work with us. True ham friendliness and good sportsmanship followed when they offered us all their gasoline (we needed some more) and lots of advice on what stations to look for in Maine.

Ed, W1CUO had arrived late in the afternoon. He, W1VRK/1 and Fred, W1HLP/1 started operations. I did no operating until around 11 o'clock. Of course I did a lot of listening—and who did we hear S-9? W1HOY and W1FZJ of course! And they were working stations fast and furious. Limitations on the equipment we used are obvious, of course, but still we had a lot of fun and did contact the stronger stations in New England—but nothing heard from Connecticut and Vermont. W1WQP, Johnny, paid us a visit for a while, mobile on 10. (As he got nearer he was on 6 and two also!) By 2 a.m. the stations started to dwindle a bit and by three Fred and I decided to hit the sack. (Ed had long since curled up in his car and gone to sleep.) This all went on during a light rain (it never rains on the mountain).

Sleep

Fred's Nash Rambler wagon made up a pair of pretty good beds and it wasn't long before I was sound asleep. It seemed like minutes later when I heard the loud, persistent sound of the gasoline generator. Sure enough, Fred had arisen at 6 o'clock and started in. Of course no one was on the air then (except W1FZJ) so I left Fred to listen to two meter hiss and I went back for another hour of sleep. This made four. I had to make up four somewhere else before going to work Monday morning.

As eight o'clock approached, it was the vote of the multitude that Fred attempt frying bacon and eggs with his hotplate. Boy! Listen to that generator labor! But the bacon was terrific and the hard-boiled eggs weren't bad either.

By then the stations on the air had begun to grow and we made plenty of fine contacts with the boys. One said: "I don't believe in this contest business!" But he gave us a number and his county anyway, and we thanked him. Once in a while I had to switch to the SX-71 to ferret out the weaker stations that were buried in the mountain-top QRM—that is every mountain top seemed to have a station on it—and the "down-low" boys were down low!

I caught ARRL's Ed Tilton W1HDQ, calling CQ on CW—something I had not expected! But Ed was not tuning the phone signals and I couldn't key the Gonset. I wonder if that would have given me Connecticut—oh, well, I didn't get him anyway.

By this time W1FZJ was calling New York stations and a few in New Jersey. Although on field day this was not uncommon, band conditions this time were not good for long haul. I then dreamily aimed my beam toward northern Maine and Canada—no need to comment. No, I didn't work any W2's either.

The sun didn't bake us Sunday as it had done the day before and although we missed good picture weather we were glad of the relief from the heat. In fact, we wondered about possibly good band conditions at first as there was a heavy mist—almost a fog—covering the mountain top early in the morning. This soon dissipated, however and no W3's came in.

As noon approached we were getting a bit weary—and kept hearing the same stations calling "CQ Contest!" over and over. The temperature was beginning to rise a bit too—and we had quite a chore ahead of us in getting down the masts and beams and packing up. Both Fred and I wanted to catch up on our sleep before going to work the next day, but Ed had gotten a pretty good night's rest. Ed however announced authoritatively: "We've got about a half-hour's worth of gasoline left and THAT'S ALL!" "Well, let's hurry up and get some more points" I yelled and sat down at the table. Between noon and 1:40 I worked only 4 more stations! That was it. By this time Ed and Fred had decided to help the generator stop rotating by depressing the "off" button.

It was quiet up there on Mt. Agamenticus. No generator, no receiver hiss, no ". . .W1FZJ calling W2 . . ." nothing.

Taking down the antennas didn't take as long as putting them up, but wondering how we could get all the stuff into the wagon and trailer made breaking up camp seem to drag out a bit. Besides, it was getting hot as the sun finally made its appearance. I couldn't help wondering if the band suddenly opened up as the power was cut. I guess I will never really know (until I see the winner's final score) but I hope next year the contest will be from say 2 to 2 or 3 to 3—'cause it hurts to have to shut down early!

Arrival Home

Sleepy and black we arrived at the North Shore and sorted stuff sort of on a one-for-you and one-for-me basis—at this point we didn't care who got what as long as both of us got some sleep and four shades whiter. Eddie had long since out-distanced us in his sleek sedan and was probably at the beach by now.

Observations and conclusions:

1. *CQ* VHF party a lot of fun.
2. *All* must be sacrificed for VHF.
3. Don't expect to hear ZS5's.
4. Non-leaded gas is expensive.
5. Pick a spot around which are stations in all directions—not just in one direction.
6. Bring more ice cubes.
7. Mosquitoes don't like VHF men.
8. Sleep and contests don't mix.
9. Bring a raincoat.
10. Flashlight batteries don't last forever.

Ed, Fred, and Gene will be anxiously waiting *CQ*'s next VHF contest. Just wait and see! ■

a Synchronous Detection

Adapter for Communications Receivers

Since the appearance of a recent article[1] on synchronous detection and double sideband suppressed carrier AM transmission, considerable amateur interest has been shown in methods of implementation. The key to the improved technique is the detection method—synchronous detection. In synchronous detection the incoming signal is mixed or heterodyned with a locally generated carrier which is phase locked to the position where audio output contributions of the upper and lower sidebands reinforce each other. It is an efficient method of detection and takes full advantage of the capabilities of the DSB transmitter as described[2] . . . John P. Costas, W2CRR.

Synchronous Detection

Synchronous detection is similar to the phasing technique used for SSB reception except that the locally generated carrier is phase locked with information derived from the sidebands of the transmitted signal. Note that the carrier, if transmitted, is ignored by the receiver. Synchronous detection takes advantage of the inherent diversity feature of all double sideband emissions, since the detector combines the intelligence in both sidebands. This is of value under condtions of selective fading.

Synchronous detection can be accomplished at either the signal frequency or at an intermediate frequency. Almost ideal receiver selectivity can be obtained by detecting at the signal frequency and using low pass audio filters following the detector. By detecting at an intermediate frequency, the selectivity will be determined by the i.f. bandwidth if no audio filtering is used. The usual 6 kc bandwidth of most receivers is most desirable for speech reception without additional filtering. A synchronous receiver, in which the incoming r.f. signal is mixed with the coherent local oscillator signal producing audio directly, may involve construction techniques beyond the facilities of the average amateur. The simple adapter to be described illustrates the fundamentals of the synchronous detection process by detecting at an intermediate frequency. It will enable a good superheterodyne receiver to utilize the advantages of DSB transmissions and many other advantages of synchronous detection. Since it is only a detection process it will not improve sensitivity, stability or spurious responses of a receiver.

The adapter to be described represents the author's initial attempt to economically adapt these improved reception techniques for amateur use. It is not presented as a finished design with optimized circuitry or as a technical paper on techniques. Much desired information on theory and applications obviously is beyond the scope of this treatise. If it serves as a starting point and inspires further experimentation while providing improved reception, the objective will have been fulfilled.

W2CRR has shown that maximum receiver performance is obtained by synchronous or coherent detectors. With detectors of this type, the audio output of both sidebands add to reinforce one another when the local oscillator is maintained in proper phase relationship. When the local oscillator phase is 90° from the proper phase, the audio output contributions of the upper and lower sidebands cancel each other and an audio null results. We may use this sideband relationship to reinsert a demodulating carrier at the correct frequency and phase to extract the intelligence from the sidebands.

Basic Elements

The elements of a synchronous detector are shown in the diagram. The signal input is applied to two basic receivers with their local oscillator injection voltages in phase quadrature

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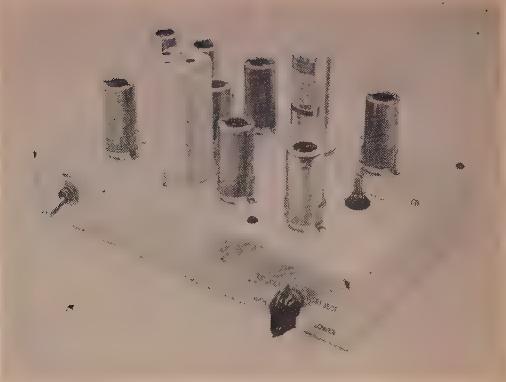
[1] 1—Synchronous Communications, John P. Costas, *Proceedings of the I.R.E.*, Dec. 1956

[2] 2—AM versus SSB, John P. Costas, *CQ*, Jan. 1957

John K. Webb, W0AHM/2
General Electric Company
Light Military Electronic Equipment Department
Utica, New York



to each other. Assume momentarily that the "I" Channel local oscillator injection voltage is the same phase as the carrier (transmitted or suppressed) component of the AM signal. Then, the in-phase or "I" channel will contain the demodulated signal while the quadrature or "Q" channel will contain no audio as its injected local oscillator is shifted 90°.

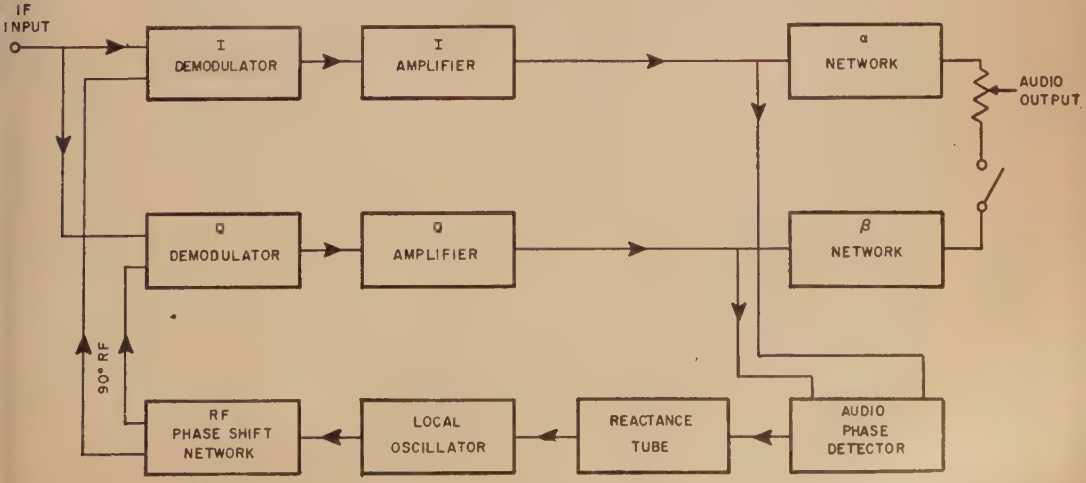
Now, if the local oscillator drifts slightly, the "I" channel will be relatively unaffected but "Q" channel will produce some audio. This will have the same polarity as "I" channel audio for one direction of local oscillator drift (and opposite polarity for opposite direction of local oscillator drift). The "Q" channel level will be proportional to the oscillator drift for small errors. By simply combining the "I" and "Q" audio in an audio phase discriminator, a dc control signal is obtained. This control voltage tunes the oscillator via the reactance tube and returns or "locks" the oscillator to the correct phase, where audio is present only in the "I" channel.

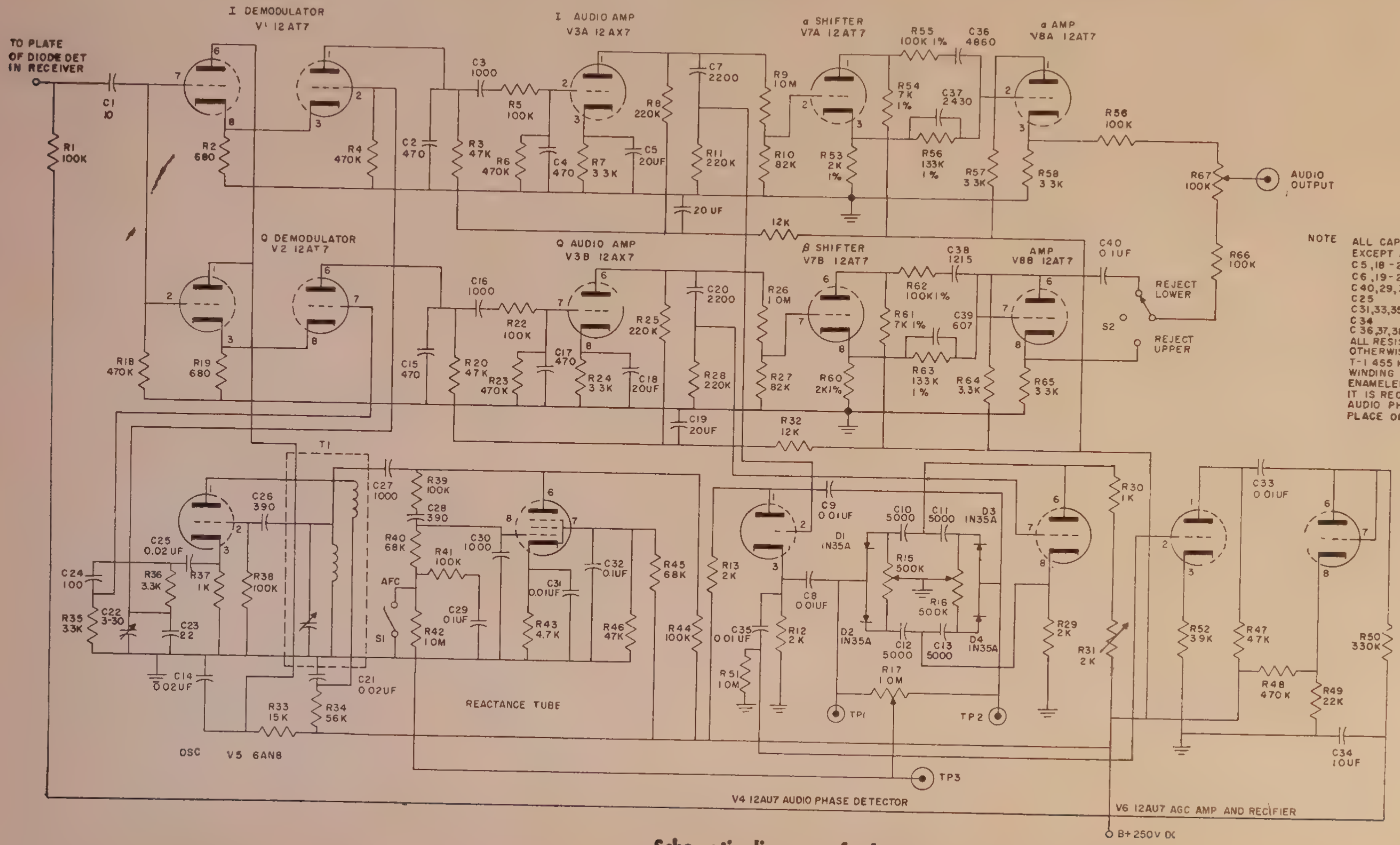
The audio phase detector delivers a dc voltage only when the "I" and "Q" audio signals have in-phase components. Since "I" and "Q" audio will be in phase quadrature in any case where like sideband components do not exist on each side of the carrier, the phase detector provides no AFC voltage for SSB or CW signals. The phase detector is therefore unaffected by heterodyne interference. With no phase lock, audio appears in both "I" and "Q" channels and alpha and beta networks (90° audio phase shift networks) on the "I" and "Q" channels will permit SSB reception by the phasing method.

If "I" and "Q" outputs are taken through alpha and beta networks respectively, interference rejection may also be obtained. When locked on a signal containing interference in the lower sideband, for example, "I" channel produces audio resulting from both sidebands and lower sideband interference, while "Q" channel contains only interfering audio. Phase cancellation by combining the two audio outputs will remove the interference while still adding the desired information in both sidebands. Other combinations are obviously possible.

A few not too demanding precautions must be observed in order to obtain optimum performance from the synchronous detection process. They are:

1. Intermodulation distortion in the demodulators must be low.
2. The "I" and "Q" channels must have identical phase shift characteristics.





Schematic diagram of adapter

NOTE
ALL CAPACITORS ARE 400V MICA
EXCEPT AS LISTED BELOW:
C5,18 - 20UF 25V
C6,19 - 20UF 450V
C40,29,32 - 0.1UF 400V PAPER
C25 - 0.02UF 400V PAPER OR CERAMIC
C31,33,35 - 0.01UF 400V PAPER OR CERAMIC
C34 - 1.0 UF 50V PAPER
C36,37,38 AND 39 ARE 1% TOLERENCE
ALL RESISTORS ARE 1/2 WATT 5% UNLESS OTHERWISE SPECIFIED
T-1 455 KC IF TRANSFORMER WITH ONE WINDING REPLACED WITH 100 TURNS #36 ENAMELED COPPER ON A 1/2" SLEEVE
IT IS RECOMMENDED THAT A MILLEN 75012 AUDIO PHASE SHIFT NETWORK BE USED IN PLACE OF α AND β NETWORKS

Use of matched resistors and capacitors is best, but 5% tolerance components are adequate.

3. The "I" and "Q" Channel local oscillator injection voltages must be in quadrature.
4. Audio operated AGC must be used in order to prevent overdriving the audio phase detector.
5. The frequency response of the "I" and "Q" inputs to the phase detector should drop at least 12 db per octave below 300 cycles.

Although local oscillator stability must be reasonably good, stability sufficient for SSB reception is more than adequate for synchronous detection. The equipment to be described was built from components available in most junk boxes and gives good performance with a NC-125 and equivalent receivers over the entire tuning range. Alignment is straight forward and requires only a VTVM.

The block diagram of figure 1 applies to the schematic of the previously referenced synchronous adapter with the addition of an AGC circuit. The adapter may be connected to the receiver via the second detector tube socket on many receivers. The i.f. is brought out, audio and AGC voltage (derived from audio, since carrier is ignored) are fed back to the receiver, and the "S" meter will indicate sideband strength.

Product detectors, V1 and V2, were chosen for the "I" and "Q" demodulators in lieu of exalted carrier diode detectors in the interest of linearity. The "I" and "Q" audio amplifiers, V3a and V3b, are conventional. The audio phase detector is of greatest interest and is the heart of the system. It is fed with audio from the "I" and "Q" channels through the phase inverters V4a and V4b. With no audio present in the "Q" channel, no dc output appears at TP3. If audio appears in the "Q" channel, indicating incorrect tuning of the local oscillator, dc of the correct polarity to retune the oscillator appears at TP3 with the diodes connected as shown. The local oscillator and reactance tube circuitry are conventional. T1 was made from a 455 kc i.f. transformer. One winding was replaced with 100 turns of ♯36 enamel wire on a ½ inch diameter sleeve and the coupling adjusted to give –6 to –8 volts across R38. The 90° local oscillator phase shift is obtained from two 45° phase shifts through C24, R35, R36, C22 and C23. For operation at an i·f. other than 455 kc the capacity values should be changed in an inverse proportion to frequency. Tubes V7 and V8 and the associated audio networks are not essential to the synchronous detection process but facilitate alignment and add to the usefulness of the adapter. The networks are conventional 90° audio phase shift networks familiar to SSB enthusiasts and are available commercially or may be assembled from measured components. Assuming the adapter is correctly aligned, the networks provide "Q" channel interference audio 180° out of phase with either the upper or lower sideband of "I" channel audio, depending on the position of switch S2. When the local oscillator is synchronized or "locked" on a signal, audio resulting from both upper and lower sidebands appears at "I" channel output and no sideband audio appears at "Q" channel output. If interference appears in the lower sideband it will result in interfering audio in both "I" and "Q" channel lower sideband outputs. By switching S2 to REJECT LOWER, all interfering signals in the lower sideband will cancel in the combined "I" and "Q" outputs and all desired information present in the lower sideband will be retained for addition with upper sideband audio.

Upper sideband interference may be similarly rejected by switching to REJECT UPPER. Remember, "Q" channel has no components of the desired double sideband signal, so it cannot cause cancellation of the desired audio from either sideband. If the local oscillator is "unlocked" by grounding the audio phase detector output (AFC OFF), audio appears in both "I" and "Q" channels and the adapter becomes a SSB converter. SSB, or either sideband of a DSB, AM, NFM, or PM signal may be selected. This interference rejection feature may also be used to improve CW reception. The audio operated AGC circuit, V6, works well with all types of signals. The attack time is controlled by R50 and C34 and the release time is controlled by C34 and the resistance looking back into the receiver. The time constants may be modified slightly by the receiver constants. AGC as used here was found superior to conventional AVC, as AVC regulates on carrier information and this circuit operates on audio output independent of modulation percentage.

Prior to connecting the adapter to a receiver, the BFO should be adjusted to the center of the i.f. passband by tuning it so that the lowest pitch noise is heard. Do not readjust. Remove the second detector diode from the receiver and connect the adapter input to the socket pin which is connected to the last i.f. transformer secondary. This connection takes i.f. from the receiver and feeds AGC voltage back in. If the receiver AVC voltage is developed somewhere other than in the envelope detector, the AGC voltage should be applied by direct connection between C34 and the receiver AVC line. The adapter audio output should be connected to the receiver phono input or audio amplifier.

Adjust the tuning of T1 to produce zero beat with the receiver BFO. This aligns the

[*continued on page 117*]

Confusion . . .

. . . Compounded

Charles W. Kram Jr., W5TFZ
Route 1, Shiner, Texas

To set the scene we must state that the following events are taken straight from the back sheets of the log of an anonymous ham. All names are left out except for that of the visitor who didn't think that anyone would dare to print this yarn and so gave his consent.

As the curtain comes up, a visitor named Bob ushers himself into the shack where the licensee is busy figuring out some new circuits in a well known ham magazine.

Ham: "Howdy Old man."
Visitor: "Oh but I'm not so old."
H: "Anyway welcome to the shack."
V: "Thanks, where is it?"
H: "You're in it."
V: "Looks like a living room."
H: "But it's my shack."
V: "Then where's the house? Ha, ha!"
H: "Hi, hi."
V: "High, like up off the ground?"
H: "Nope, I said hi hi like ha ha."
V: "Now then, where is your studio?"
H: "We don't have regular studios."
V: "We? You mean there are others with you?"
H: "Only the junior operator."
V: "Oh you have a relief operator like in th
Navy?"
H: "Nope, my boy is much too young for
ticket."
V: "But what about the junior operator?"
H: "I meant the XYL brings the harmonic i
when he causes too much QRM in her par
of the QTH."
V: "Hmmm. Well, anyway, may I see you
station?"
H: "Of course, but the stuff in here is mostl
home brew equipment."
V: "Home brew? Is that legal?"
H: "Sure is. I even buy lots of materials gov

ernment surplus."

: "But does Uncle know what you use them for?"

: "He licensed me."

: "That makes you commercial?"

: "Nope, strictly ham."

: "Where did you say you bought your equipment?"

: "I said I made it myself."

: "Yes! And now, about your station."

: "What about my station?"

: "Where is it?"

: "We were just looking at it."

: "Ohh. That was your radio station?"

: "Yes."

: "How does it work?"

: "I'll show you; first I kick on the main switch like this."

: "Wait a minute, you used your hand that time."

: "That's right, I use my foot only on the big center tap."

: "The big what?"

: "I said I use a foot switch to key the main power supply."

: "What power did you say it supplies?"

: "It feeds the big bottles."

: "Which bottles?"

: "The bottles in the final."

: "The final what?"

: "The AM, CW, SSB final."

: "What?"

: "The final with the 813's."

: "Ohhh that one; hmm."

: "Now guess I'll listen to the band."

: "Guy Lombardo is my favorite."

: "No, no. I said I would monitor 75 meters."

: "I'll wait here."

: "Notice that I hold down the VFO spotting switch while I zero in."

: "What for?"

: "It's impolite to swish the band with a rock crusher."

: "How come?"

: "Because it snows 'em under."

: "Whom?"

: "The peanut whistles."

: "What did you say?"

: "I meant that swishing drowns out the flea-power boys."

: "Never mind which boys, but what is a rock crusher anyway?"

: "Anything over a half gallon I'd say."

: "It isn't plain at all."

: "What?"

: "Ham radio."

: "Let's have a short QSO and you'll feel better."

: "No thanks, I don't drink."

: "No, no, I meant let's fire up the rig."

: "Hey, what's this gismo?"

: "That's a Vibroflex."

: "A Vibro what?"

: "I said it's a bug."

: "Prehistoric?"

H: "Nope, but it's plenty ancient."

V: "What does it do?"

H: "I use it when I work CW DX."

V: "Work what?"

H: "I meant I use it to pound brass."

V: "Pound brass?"

H: "That's right, it hammers out the dots."

V: "Have you ever hammered copper?"

H: "Nope, I'm no good at metal work."

V: "B-b-but. Oh say man, do I see a hose running up that chimney?"

H: "Nope."

V: "It looks like a hose."

H: "But it isn't

V: "What is it?"

H: "It's my RG11/U."

V: "Your RG what?"

H: "I said it's my coax feedline."

V: "What does it do?"

H: "It feeds the soup up to the old squirter."

V: "What soup?"

H: "I was referring to r-f electromagnetic energy at 3800 kilocycles."

V: "What kind of cycles?"

H: "3.8 megacycles."

V: "Anyway, is there really something up there that squirts?"

H: "You bet; I've practically got a pipeline to Capitol City."

V: "A pipeline."

H: "That's right; those beer can verticals sure get out."

V: "Am I nuts?"

H: "Why?"

V: "I think I ask too many wrong questions."

H: "How can you learn without asking?"

V: "All right then, how is TV reception?"

H: "Don't own a set."

V: "Then what is this?"

H: "That's my 'scope."

V: "They're fine for seeing things close up."

H: "Nope."

V: "For looking at the moon and stars?"

H: "Nope."

V: "Then what is it for?"

H: "It indicates modulation envelopes."

V: "What kind of envelopes?"

H: "I said I use it to check audio."

V: "Say, are all ham stations like this?"

H: "Nope, some are mobile."

V: "Just like police?"

H: "Nope, police are commercial."

V: "Wow! Do you see what I see?"

H: "Where?"

V: "That insect on the couch."

H: "Don't move, I'll get the Flit."

V: "No, no. That's a genuine Bristletail."

H: "What did you say it was?"

V: "It's either a Thysanura or an Entotrophi."

H: "Hmmph! Looks like a pest to me."

V: "I'll rush over to my brother's house and get my specimen box. Don't do anything till I get back. Bye."

H: "Doggone it! The hobbies some guys have. Sounds like Greek to me." ■

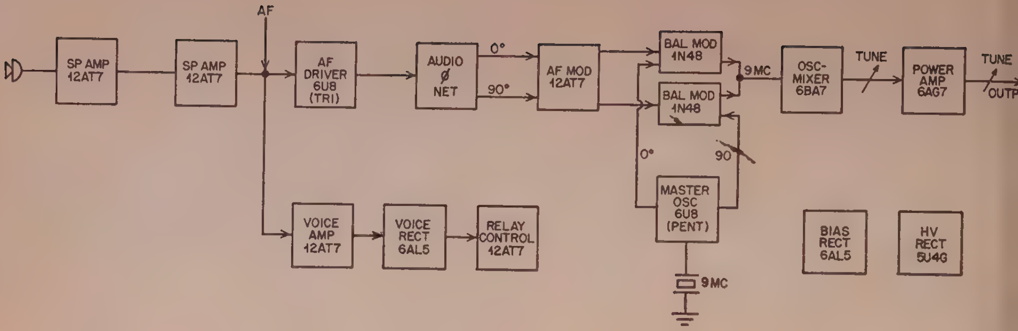
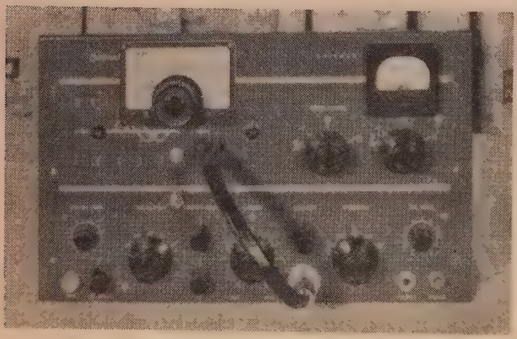


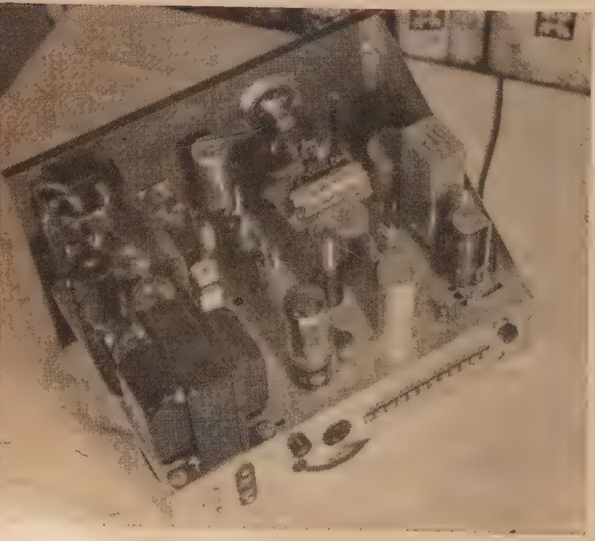
Fig 1. Original block diagram

Shoes For The 10-B



Front of modified unit

Interior of modified transmitter



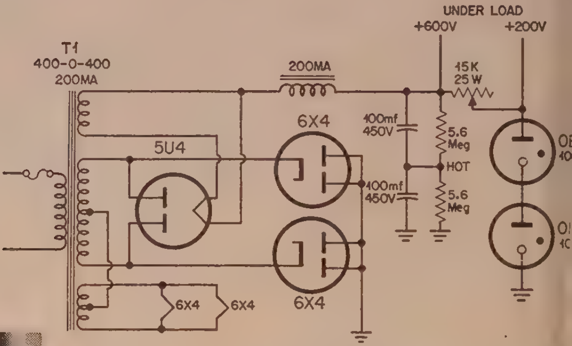
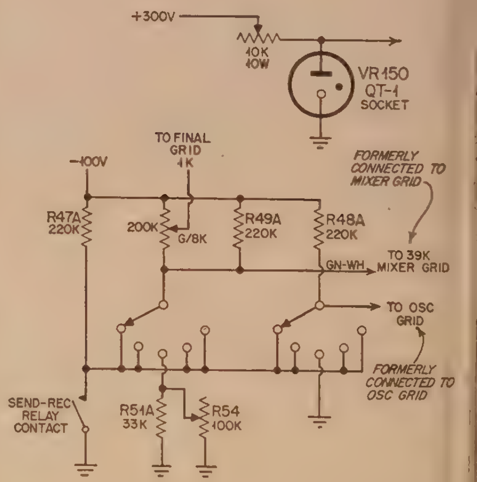


Fig 6. Above and below: modified power and bias circuits.



E. H. Sommerfield, W2UQB
408 Day Hollow Road
Endicott, New York

On the odd chance that there may be o or two economy minded hams left I thoug I would release a few instructions on how poke out a respectable signal on SSB witho taking a wheelbarrow to the bank.

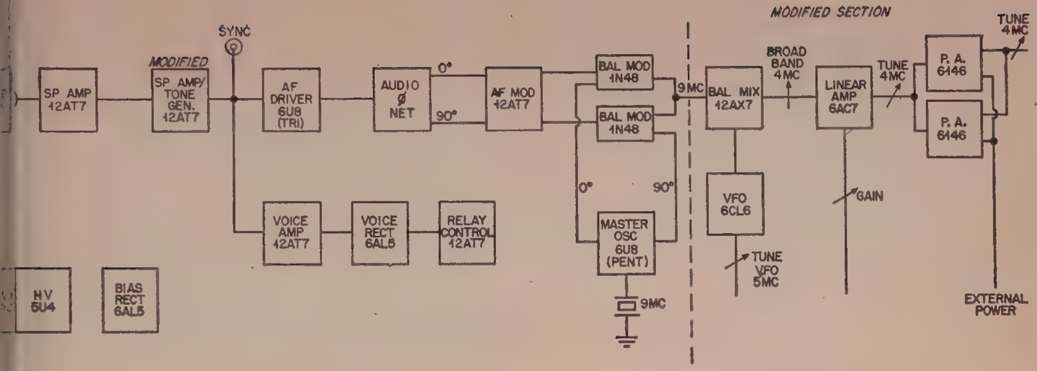


Fig 2. Modified block diagram

Both the 10-A and 10-B SSB exciters (Cen- al Electronics) are available pretty reasonably ese days. By adding a few parts and moving ings around a bit you can have a 100 watt B rig. This article covers the conversion for and 75 meters, but you can add any others u want with little difficulty. Refer to *fig 1* r a block diagram of the original rig and to *2* for the converted unit. Added are a VFO, ixer, Driver, a modified speech section with tone generator and a pair of 6146's.

Fig 3 shows the modified speech amplifier. ne "Tone Amplifier" switch is mounted in ace of the "AF Input" jack, see photo of assis bottom. *Fig 4* shows the modified bal- nced mixer, VFO, and class A r-f amplifier. The "RF Gain" pot replaces the VFO/Xtal vitch. The VFO operates at 5 mc since I was terested in 20 and 75 meter operation. It can sily be changed for output on any of the ama- ur bands. In the 10-B in the photograph an ternal connection is made between the VFO be and tank circuit. In later conversions I ave drilled a hole through the chassis so this oes not have to come out on the front panel.

[*Continued on page 113*]

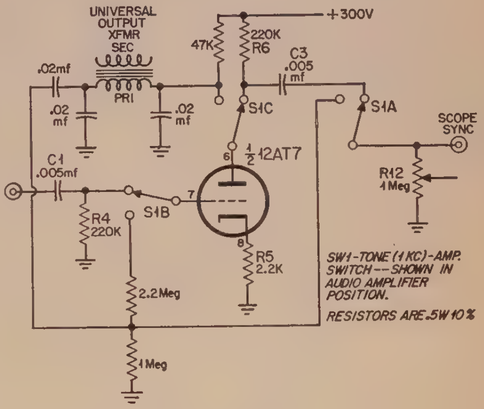
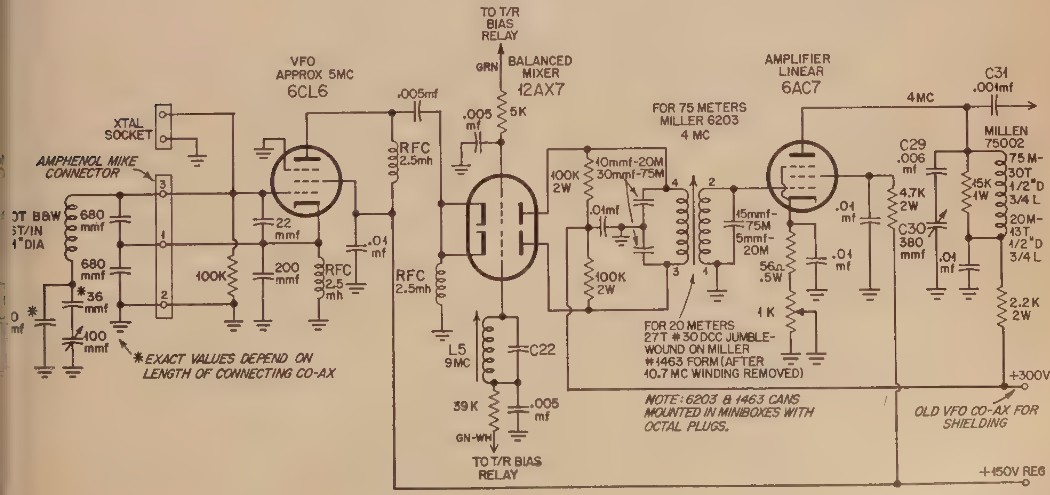


Fig 3. Audio tone generator, modified 2nd Audio amplifier

Fig 4. Modified VFO/Mixer/Amplifier circuits



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Putting Snap into QSL Cards

CQ's QSL contest is almost three years old, yet competition is just as keen today as when the contest started. Looking at samples printed these latter months, I'd say the Judges' job gets tougher with each issue.

Hams associated in any way with the printing art readily recognize the background of ingenuity and effort represented by each QSL from conception through development and printing. Naturally, this is true only for a small percentage of us. For the host of hams unacquainted with printing who want to improve their present QSL cards or obtain effects noticed in the contest displays, various printing techniques and design principles are discussed.

Reproduction Methods

Transferring images to paper is not always printing. It can be photolithography, silk-screening or straight photography. Let's have a quick explanation of each method and then settle to printing where most of the snappy QSL work falls.

PHOTOGRAPHY—Most everyone today is familiar with that part of photography that involves aiming a camera and snapping a picture. Many, however, may not understand what happens from there on. As photography performs such an important part in printing and the associated reproduction arts, we should start with it to understand the others.

When the camera shutter "clicked", light struck the film affecting its emulsion material. Put in a solution called a developer, the light-struck areas become the image while the remaining areas dissolve into the solution. After a short immersion in a fixing solution, the film now called a negative is washed and ready for reproduction use. This film is called a negative because it is reversed in light-tones from those in the original image—what was white then is now dark and the original blacks are light.

A negative can be placed against sensitized paper and held before a light source to produce the picture on paper as originally seen. This is known as contact printing and is the process used when a roll of film is left at the corner drugstore for developing and printing. But this negative also can be held against other sensitized materials and the image made to appear on them. This is the step that ties photography so closely to printing and the associated arts.

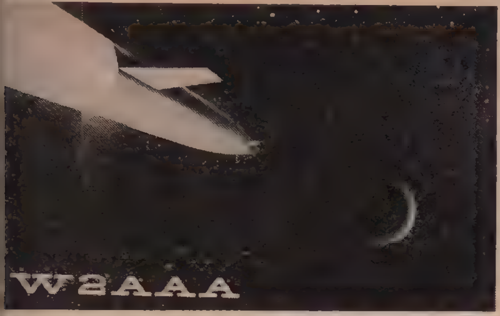
SILK-SCREEN PRINTING — If instead of paper a piece of silk is sensitized, a negative placed against the silk and exposed to light will produce an image on the silk which will become visible when developed. To make reproductions, the silk is stretched taut in a frame and paper put underneath it. Pigment placed on top of the silk screen is pressed through the image part of the silk and appears on the paper. Areas of the silk not containing a part of the image, are sealed to prevent the pigment from penetrating those portions.

PHOTOLITHOGRAPHY—This method is always dependent on photography regardless of simplicity or complexity of the material to be reproduced. Both text and illustrations must be photographed. The negative is placed against a sensitized metal plate and exposed to a light source. This transfers the image to the plate where it can be seen after developing. This plate is smooth; there are no raised or sunken areas.

To make reproductions, the plate is placed in a lithography press better known as an "offset" press. This printing method is based upon an attraction and repulsion principle. Ink is attracted to the image lines on the plate while a repellent solution covers the remaining portions. This feature causes the image to reproduce from the perfectly smooth plate.

The word "offset" is used by the "trade" for

Fig. 1 Importance of theme outweighs call letters. Bluish-black color captures cold moonlight reflecting from flying missile in star-studded sky.



is type of reproduction because the plate earing the image never touches the paper. nstead, it presses against a drum bearing a ubber blanket depositing the image on this lanket. The rubber blanket in turn presses gainst the paper transferring the image to it. ffsetting of the image onto the rubber blanket hich transfers it to the paper gives rise to he term "offset."

RINTING—Printing is done by covering aised surfaces with ink and having them press irectly against the paper. These raised surfaces may be either type or plates or a combination of both. On short quantity "runs" the pe contains the reading matter and the plates e images; on long "runs" an electro-plate is ade because this metal is more durable.

Type matter and drafting illustrations are rinted from solid raised surfaces, and produce solid lines of ink on the printed page. hotographs are handled differently. A photograph contains gradation of color from white black. Between these extremes lie many hades of gray called halftones. To capture ese tones a picture, or halftone as it is called the printing arts, is photographed by the rinter through a halftone screen placed before e camera film. This screen for good commercial printing will contain 120 to 133 lines er inch in both vertical and horizontal directions. This causes light reaching the film negative to break up into little specks called dots. White areas of the picture make big dots on e negative and black areas make small dots. he tones of gray in the picture will cause arious size dots on the negative depending n the density of the gray tone.

Transferred to a metal plate which produces e image on the paper, these fine dots of the egative become dots on the metal plate. Big ots on the negative permit small amounts of ght to shine through causing small dots to ppear on the plate. Likewise, small dot areas f the negative cause big dots on the plate. Big ots on the plate print big dots on the paper producing the black areas of the original picture. The white areas of the original picture are transferred to the paper by the small dots. The variation in dot size between those producing black tones and those producing white ones cause the gray tones of the original picture to be produced. The larger the dot on the metal plate, the darker the gray tone. A strong magnifying glass placed over a printed photograph will enlarge a small area and make these dots visible.

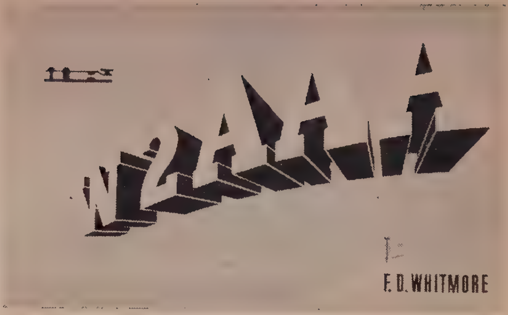


Fig. 2 Call letters main feature in the theme.

Basic QSL Design Principles

Attractive QSL cards capture attention. In transit and upon arrival they lure one's attention. What is the mysterious force that attracts attention to one card over another? Not all these viewers are hams; many are associated in work completely foreign to radio and never heard of an amateur radio operator. What then is this elusive "attractiveness" that compels interest?

To discover this mystic power of attraction let's return to photography for the answer. How many times have we made a series of snapshots on our vacations and taken delight in telling our friends about the trip. Eagerly we showed the pictures and started *explaining* what they were and why we had taken that particular "shot."

That last sentence points the finger to the secret. It lies in that word "explaining." Why did we explain the picture? A good picture tells the story. A story-telling picture will draw attention causing viewers to ask questions because of their further interest. Thus evolves the captions below newspaper and magazine pictures. They are there to answer your further questions. Look at Life magazine for proof of this technique. Since Life many other picture magazines have appeared. All make the photograph tell the story. Does this really work? Proof lies in the magazine's circulation figures.

ATTRACTIVENESS—Whether a QSL card or photograph, the rules are the same: Make the general theme predominant, don't clutter with extraneous material, capture the eye on a highlight and carry it through the rest of the design, place this highlight at one of the four important points for any picture, keep the design current with the times, and pick your colors to support the design.

Usually, the less put on the QSL the more potent the design. However, if the theme of the design is helped by filling up the card, do so; but use extreme care less you distract. Following are DOs and DON'Ts to create snap in the design.

A GENERAL THEME—Timely themes attract attention. An internationally prominent theme today is flying missiles (see *fig 1*), another jet propulsion. Maybe some feature of your work or your habitat could be used. A theme on peace should have universal appeal at this time. In general the greater the masses conerned or interested in the theme, the greater the attracting power.

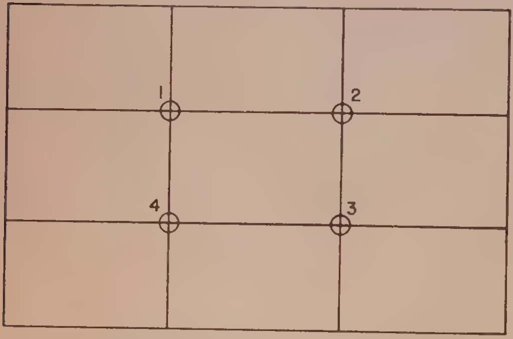


Fig. 3 Points of main interest. Use one for main theme point. Selection depends upon action direction of design.

ELIMINATE CLUTTER—Ordinarily, I would suggest that the theme stand alone with the station call letters. If the theme is the highlight, keep the call letters small. If the call letters are the main part of the design, make them big (see *fig 2*). To avoid clutter, put all statistical data on half of the reverse side of the card (see *fig 7c*).

One outstanding exception of a fine card with everything on the front is the one designed by W4RBI for the CQ gang. This is a nicely balanced card with the theme, "One of the CQ gang." All the additional material helps this card identify the organization and the individual of that organization, therefore it doesn't distract from the theme. A picture of this card appeared in CQ for June 1956 on page 127.

HIGHLIGHT THE IMPORTANT POINT—Picking up a QSL card, the eye should be drawn to the important part of the theme and carried smoothly through the rest of the design. It shouldn't have to jump around for something interesting to alight upon. This, incidentally, is another secret of good photography that captures and holds interest. Color can be used to highlight and draw the eye to the main point in your theme. Place this highligh at one of the four interest points in the picture See figure 3 for the location of these points.

SELECTING THE COLORS—First, don' pick colors that clash such as blue and green Second try to use colors that are natural to the scene. If the flight of a missile through the sky is used, try to picture it in your own mind. Would it just be a gray spot in the blue sky in daytime? If so, would that be very attractive? How about at night with it reflecting the cold blue of moonlight in a blackened star-filled sky? (See *fig 1*)

Designing the QSL

MAKING THE DESIGN—QSL printers supply samples of their cards for a nominal fee. If any satisfy, an order plus your call letters is all that is required. Designing a QSL will start when nothing available satisfies. Unfortunately, so does the cost.

New creations are economical if confined to type possessed by the printer. If possible pick a type face from the printer's style book for the call letters and let him select some smaller type to blend with it for the additional data. Show him a sketch of the layout you like and he will make up some proofs for approval.

Fig. 4 Color proof of printing plates run by photoengraver.

Proceeding from the QSL produced strictly from type, the next step is to have some design printed on the card. This can be placed anywhere. It can be an outline of your state with your QTH marked with an asterisk, a map of the whole United States, or any other diagram that appeals. Whatever it is, the photoengraver must make a plate. The design will be printed on the card first usually using a different color ink than the type portion. The type parts of the QSL can then be printed around this design or over it depending on the layout theme. This special design can be made by a draftsman, traced from an original if the size is right or photographed to required size by the photoengraver from the large original.

THE ARTIST'S JOB—Beyond these simple

ne-drawing designs which are used in con- nction with type, are the complex designs quiring the services of a commercial artist.

The artist will blend two things, the pictorial rt and the lettering. He can attain a beauty ith letters few people realize. One of the best aces to observe and study lettering effects is e movies. Watch the credit rundown of a chnicolor picture noting the shapes and color eatments. Watch for the peculiar contours d color shading. Note how the letter style ends with the picture theme. Each little fea- re converges to make the resultant effect a ing of beauty. This is the artist's domain.

From suggestions supplied to him or from cts he gathers related to the subject, a com- ercial artist will supply several sample de- gns called visuals. If one of these is selected, a composite chosen using ideas from the veral, the artist then makes a comprehensible. his will be neatly done and contain the true lor tones. The printer will use this color ide to match the ink.

The next step by the artist is to make sepa- te pieces of artwork for each color containing nly that part of the design that will print in hat particular color (See *fig 5*). These various ieces of art must register perfectly when placed ver one another; otherwise, when printed the lors would not be confined to the right parts the design.

This separation artwork goes to the photo- ngraver who photographs each piece, holding the exact sizes, and exposes the negatives sensitized metal plates. The plates are placed an acid solution which erodes the area bear- g no image. Large non-image areas are usual- routed out to be sure they don't affect the nage. The plates are then mounted on wooden locks and taken to the proof press where each late will be proved (See *fig 6*). This proof nsists of a reproduction of each plate in color nd also an overall proof showing the design with all colors in place (See *fig 4*). This proof should match the color in the artist's comprehensible. It proves that the artist's color can be obtained if the printer matches the inks.

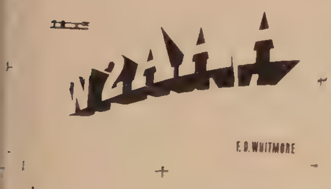
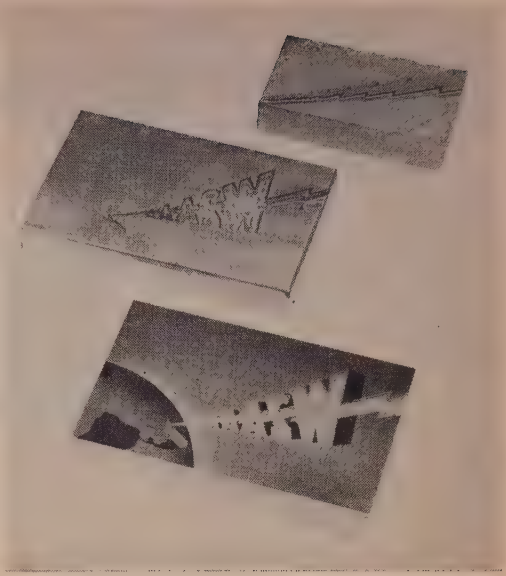


Fig. 5 Color separation artwork supplied by commercial artist.



A▲ A B▼ **Fig. 6 (a) Photograph of color separation plates made by photoengraver. (b) Finished card produced from these plates.**

The plates and color proof now go to the printer who must match the ink and print the QSL card. The color proof he received from the photoengraver shows that the design can be produced from those plates and will meet the artist's color scheme when proper inks are chosen.

Printing QSL Cards

PRINTING FROM TYPE—This style of QSL card is the most economical. It consists of placing the large type for the call letters in a form along with small type of various styles for name, address, date and equipment data. This is then locked up in the printing press. All of the printing can be placed on one side of the card, or part can be on one side and the remainder on half of the reverse side like a

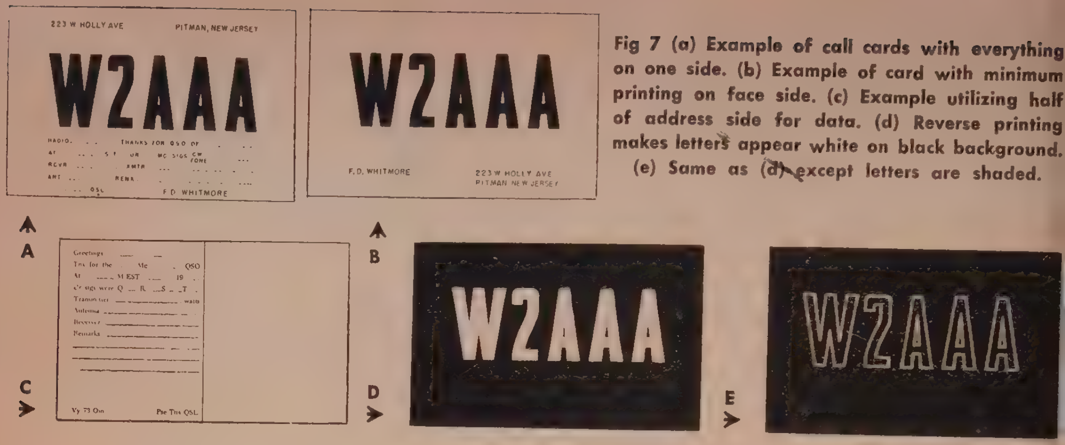


Fig 7 (a) Example of call cards with everything on one side. (b) Example of card with minimum printing on face side. (c) Example utilizing half of address side for data. (d) Reverse printing makes letters appear white on black background. (e) Same as (d) except letters are shaded.

picture postcard. *Fig 7a, b* and *c* illustrates this arrangement.

Printers will charge more to print on both sides of the card. So, if finances are in short supply, design to print on one side; if not, I recommend printing on both sides so the card will not be cluttered. Nothing fancy can be done with this style card because no story is told nor action expressed; but it still can be a dominant attraction to the receiver at that distant point. To achieve this, keep it plain.

Now, if it is going to represent me, I want it to stand out in the other ham's shack or in his pile of QSLs. I want it to stand out so much he will be tempted to place it on the wall to represent my district. But what can we do to such a simple design to make it stand out? The answer is, try color.

A two-color effect with only one impression of the press is achieved by putting colored ink on colored card stock. The other latitude allowing free movement is choice of type face. Have the printer show type face styles. A tall thin type may look best with one color scheme; if not perhaps a short broad face is better. Maybe the printer has type faces with rounded letters besides the usual angular styles. Get him to strike a proof of each, then make a selection. Personally, my choice in this case would be to have a negative photostat made (for about one dollar) of the sample type face I liked, and spend a few dollars to have a printing plate made. Printing on a white card with black ink would make your call letters appear white on a solid black card (see figure 7d). This will add force to the simple design and the card will demand attention.

One other thing about type faces should be stated at this point. Normally they have a solid metal face for the entire contour of the character. But, of course, there are always exceptions to the rule. A printer may be found with some special type that will produce characters like those in *fig 8a. Fig 8b* is an illustration of shadow cast letters. The body of the letter doesn't print; only the shadow area, that a slanting light-source would cast, prints. These make possible some interesting economical designs.

Printers also have numerous border designs which can be used to "box" the call letters (enclosed with a border). These may be little swirls, curved lines or various other little figures. Also, the printer has thin lines usable to create designs in open areas of the card. Samples of these are in *fig 9a* and *b*. However, I still strongly recommend a plain uncluttered design.

PRINTING FROM PLATES—I am always facinated by this phase of printing. It represents the cream. So many tricky, eye-catching designs can be made. Only one's imagination limits it; think of it and you can reproduce it. It can be as simple or as complicated as you

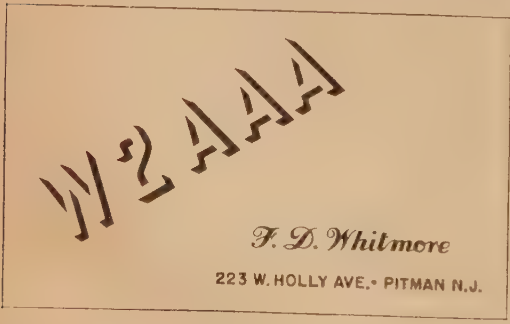
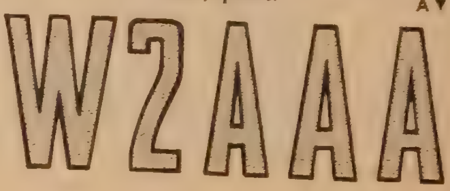

W2AAA
F. D. Whitmore
223 W. HOLLY AVE.• PITMAN N.J.

Fig. 8 (a) Body of letters is one color and outlines another. (b) Illustration of shadow cast letters. Body of letter doesn't print; only the shadow area that a slanting light source would cast, prints.



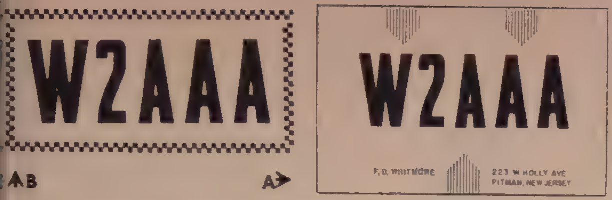


Fig. 9 (a) Slugs inserted by printer in form to print narrow lines creating design in bare card areas. (b) Example of printer's border styles used for separation and "boxing".

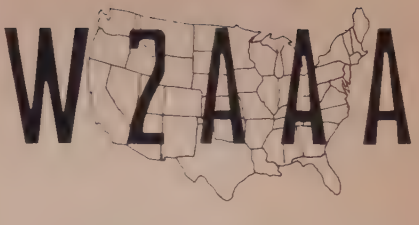


Fig. 10 Example of design printing from plates and overprinting from type.

want. Let's start with the simpler forms and expand to the complicated.

Any of the designs mentioned earlier made solely from printer's type, can be reproduced onto a plate and cards printed from this plate. However, this is just extra cost so we don't do it. Plates are used to print a design or image on the card. Combinations of type and plates are often used with attractive effects. Usually the type copy will be printed in one color over the design which is in another (see *fig 10*). Cost for this type card will be economical because many QSL printers have preprinted stocks of cards with various designs. The potential buyer is given several choices of arrangement for call letters and data which then is printed over or around the design. The printers usually have their forms already made up and need only to drop in the call letters and print.

The most beautiful cards will be done completely from printing plates. This is true because no physical restrictions apply to the design. Letters can extend over one another, run off the edges of the card, be any shape the artist wishes, and the background design is only limited by one's imagination. Letters are prettier because an artist can draw them in perspective (make them taper as they travel away from you), make them in true three dimension or distorted three dimension, as well as curve them around the lines of the card design. He also can gain force in the letter design by making the underside important so they seem to be seen from beneath (see *fig 2*). Because printers' type is on a shoulder spaces occur between letters. Letters printed from type, therefore, don't extend over adjoining letters except in unique type styles. The artist however, has no such restrictions.

Cost

USING DESIGNS OF QSL PRINTERS—The stock designs of these printers are the cheapest source of QSLs. Unfortunately, while they are adequate and in general show good taste, they do lack the sparkling individualism possible with special designs. These stock cards can also be supplied with designs printed in one color and call letters and data in another color. The cost should be slightly more because of the double or triple printing.

ARTIST COST—Cost for this service will vary throughout the country because of labor variances. It also will vary in accordance with the amount of artist work required by the design. If one of the artist's visuals is selected, he will charge less than if you require several reworks before becoming satisfied. Two color artwork will cost less than three color. For creating the design and making separation art for two or three colors, the artist may charge from fifty to one hundred dollars.

PHOTOENGRAVER COST — Depending upon the number of colors and separation artwork being supplied, the photoengraver plates will cost from ten to thirty-five dollars. Prices will vary throughout various sections of the country.

PRINTING COSTS—The printer's cost too will vary from city to city, and also in accordance with the quality of printing establishment. The smaller shops should be cheaper. Using two-color plates, the large printing houses charge about twenty dollars for two hundred cards, and about thirty dollars for two hundred cards if in three colors.

REDUCING THE COST—Now that we know how much the services for snappy QSLs can cost, let's find ways for reducing or eliminating them. To do this you must have "friends".

Hams with acquaintances in the printing business or associated arts are in the best position to get printing favors. However, don't let this stand in the way of a snappy QSL. Look among your acquaintances for people connected with the printing arts. Do you know a commercial artist whom you might "convince" to design your card? How about a commercial art student? What connections does the artist have? Does someone in the engraving house owe him a favor . . . get the idea? Maybe you can swap something for these services. The printing cost being the smallest part, you probably won't mind paying it; however, the "swap" and "who-do-you-know" idea might also work here.

Whenever the radio bug slows up and you weary of operating and building, give a little thought to your QSL. You'll be surprised with the result. ■

The ever popular Command transmitter forms the basis for a 35-watt, trunk-mounted mobile embodying remote VFO control and a space-saving plate modulator

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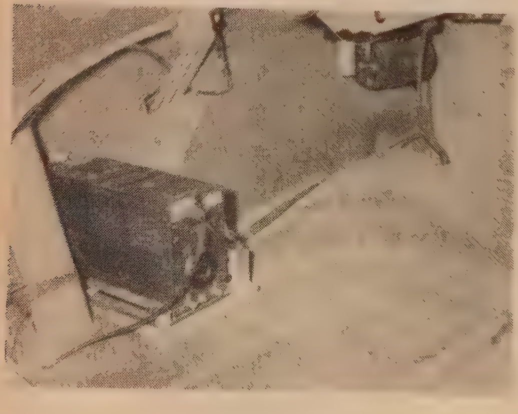
ONE for the ROAD

There is no hard and fast rule that requires appending a mobile transmitter to the car dashboard. Most amateurs prefer this type of installation because of the close control it provides. But there are instances where dash mounting is not the answer. The family car is a good example. Front seat traffic from assorted children, family pets, etc., can be a hazard to any but the most tailored-to-fit mobile. A further case is the car of such design or vintage as to be unadaptable for a dashboard rig.

These are instances where trunk mounting offers a worthwhile solution. True, such a mobile will not likely feature the multi-band coverage that a dash-mounted rig boasts. But from a practical standpoint, the part-time mobileer is more interested in QSO's than QSY's anyway. By eliminating the band-hopping feature, a bustle-stowed rig need sacrifice little of the dashboard rig's single-band utility. This article describes such a set.

A glance at the photographs at once identifies the transmitter. Choice of the BC-459 (an ARC-5 equivalent would work just as well) was based on (1) mechanical suitability and (2) a cost so low that for parts alone it would still be a bargain. Forty got the nod as band choice in view of its twenty-four hour characteristics (out West, anyway) and the compatible type of activity usually found there.

Installed in the left fender well, the mobile occupies little trunk space. A further saving is effected through mounting the dynamotor supply from the under side of the package shelf.



Modulation

The BC-459, after not-too-drastic modification, runs 35 to 40 watts input. VFO operation is retained through a remote control system. A two-tube "Reference Shift" (Radio News, April 1955) modulator—a natural for mobile service—provides plate modulation with a minimum of components. Necessary controls are grouped in a small box mounted on the lower edge of the dash as shown in the photo. Control wiring is carried through loom concealed under the floor mats alongside the driveshaft "tunnel." A departure from usual practice is the mounting of the dynamotor supply on the under side of the rear seat package shelf. Rubber insulating grommets keep mechanical noise and vibration to a minimum.

Command Transmitter Modifications

Of prime importance in a trunk-mounted rig is tuned circuit stability. This was a key item in choosing the Command rig as a basis for this installaton. Tank circuits in these sets are

Mechanical aspects of the remote VFO control are shown in this close-up view. Old timers may recognize the electric windshield wiper motor, a once-common item on Model A Fords. The slug-adjustment between the condenser and oscillator tube is for the plate coil added in the transmitter modification process outlined in the text.

Only dashboard evidence of a mobile in the W6OWP-W6SXG family car is the small control box containing indicator light, tuning and transmit switches. The main on-off switch is located on the under side, out of sight and a guard against unauthorized turning on of the mobile equipment. Reception is via a crystal-controlled broadband converter.

mechanically sturdy and adjustments are provided with a positive locking mechanism. Once set, adjustments hold true indefinitely.

Command sets are not without their faults, however. Frequency stability seldom matches mechanical ruggedness. The trouble starts when the oscillator and amplifier sections are coupled together as, of course, they must be. Inductive coupling of the original design provides too little oscillator isolation and instability when the final stage is keyed or modulated is a common fault.

To improve this situation, a pentode (6V6) was substituted for the original triode oscillator and its plate and screen wired in conventional electron-coupled fashion. No changes were made in the grid, cathode or filament circuit. The coupling between oscillator and amplifier was disconnected at the coil assembly terminal strip. In its place, capacity coupling from the oscillator plate to the final grids was substituted. A slug-tuned oscillator plate coil was incorporated as shown in *fig. 1*. This coil, however, is *not* resonant at the operating frequency. Instead, it is detuned some 500 kilocycles, thus providing a compromise between the stability of an untuned plate circuit and the power output available when the plate circuit is resonant. The adjustment is not critical so long as the detuning is sufficient to prevent excessive reaction as the amplifier is modulated.

To provide space for mounting the plate coil and the remote oscillator tuning condenser (described in a later paragraph) the "eye" tube and crystal calibrator circuits were removed entirely. An aluminum plate was cut and bolted

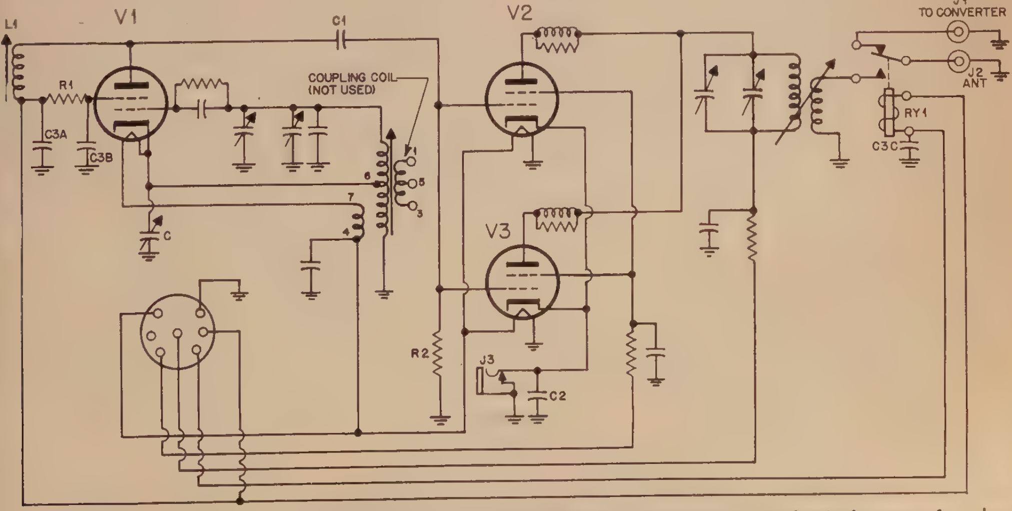


Fig. 1. Wiring diagram of the modified BC-459. The ARC-5 series transmitters are identical except for plug connections and final plate feed. Numbers opposite the oscillator coil refer to terminals on strip adjacent to the oscillator tank tuning condenser. Plug is shown as viewed from rear of chassis. Only added or changed components are listed below.

over the socket holes. The oscillator plate coil was mounted below deck in the space the crystal socket formerly occupied.

Other transmitter changes included:

1. Connecting the filament circuit in parallel; adapting the final sockets for 807's. (If a 12-volt supply were used, the 1625's would be retained).
2. Removal of the antenna loading coil.
3. Installation of a closed circuit jack in lower left hand corner of front panel with connection to final cathode circuit for metering purposes. This jack *must be* by-passed as indicated.
4. Installation of an antenna relay and coax line fittings on the front panel.

The procedure for these changes follows the same pattern as described in numerous Command set articles, a listing of which was carried in CQ's 11-year index (Jan. 1956). The complete transmitter wiring diagram, after modification, is shown in *fig. 1*.

Remote Control

Bench testing proved the feasibility of applying control to the oscillator only. To carry out this scheme, a two-bearing, 5-plate midget condenser was mounted on the chassis behind the coil shield and connected to the oscillator cathode. The condenser was positioned as shown in the detail photo with its rotor shaft extending one-quarter inch beyond the edge of the chassis. A corresponding clearance slot was cut in the transmitter cover.

Motive power to rotate this condenser required a brief QRX while ways and means were pondered. The market is not exactly cluttered with small, low-voltage gear reduction motors adaptable to servo use. But a trip to the local auto wreckers turned up a promising item—an electric windshield wiper of the type used as replacement for direct drive vacuum units. Such wipers were common on Model A Fords. Wrecking yard price of $2.00 provided a 6-volt motor with integral gear mechanism. (May be purchased new from J. C. Whitney & Co., 1917 Archer Ave., Chicago 16, Ill.) The ¼" output shaft oscillates through an arc of 120 degrees. By coupling to the trimmer we hav a tuning arangement that will sweep back an forth across a fixed frequency range.

A plate bolted to the side of a single uni Command transmitter rack supports the motor It was necessary to trim the output shaft to length which allowed clearance for a flexible coupling; in this case, a short length of rubbe tubing.

Once total condenser travel was determined, the oscillator slug was adjusted to compensate for the added capacity of the remote control condenser at minimum setting. The control condenser's plates were then trimmed so tuning range was confined to the 90 kilocycles from 7205 to 7295.

Parts list

C—Remote tuning condenser, see text.
C1—100 μμfd. mica coupling capacitor.
C2—.01 600 W.V. meter circuit by-pass.
C3 (A) (B) (C)—Three-section by-pass; original component mounted near oscillator tube socket.
L1—Oscillator plate coil, see text.
R1—470-ohms, ½-watt.
R2—10,000-ohm, ½-watt.
RY1—8000-ohm plate circuit type relay.
J1, J2—Co-ax connectors.
J3—Closed circuit key jack.
V1—6V6.
V2, V3—807.

C1—20 Mfd., 50 W.V. electrolytic.
C2—.0005 Mfd. driver coupling condenser.
C3—.003 Mfd. bias network capacitor.
R1 — 250,000-ohm gain control.
R2—220,000-ohm, ½-watt.
R3—10,000-ohm, ½-watt.
R4, R5—100,000-ohm, ½-watt.
R6—1 megohm, ½-watt.
R7—22,000-ohm, ½-watt.

T1 — Microphone Transformer.
CH1—5 Hy, 150-200 ma. filter choke.
1N38—Crystal diode.
V1—6SN7.
V2—807.
Microphone battery is a single flashlight cell.

R1—Motor speed set resistor, see text.
R2—8000-ohm, 1-watt.
R3—10,000-ohm, 20-watt screen dropping resistor.
C—20 Mfd., 50 W.V. electrolytic, spark suppressor condenser.
SW1—SPST Toggle.
SW2—SPDT Toggle, inter-comm type, center position off.
SW3—DPDT Toggle.
RY1—Dynamotor starting contactor.
RY2—Negative H.V. cutout relay.
RY3—8000-ohm, plate circuit type relay for tuning motor control.
RY4—5000-ohm, plate circuit type relay, oscillator lockout.
J1—Microphone jack.
PL1—6-volt pilot light.
Fuse—300 ma. pilot light.

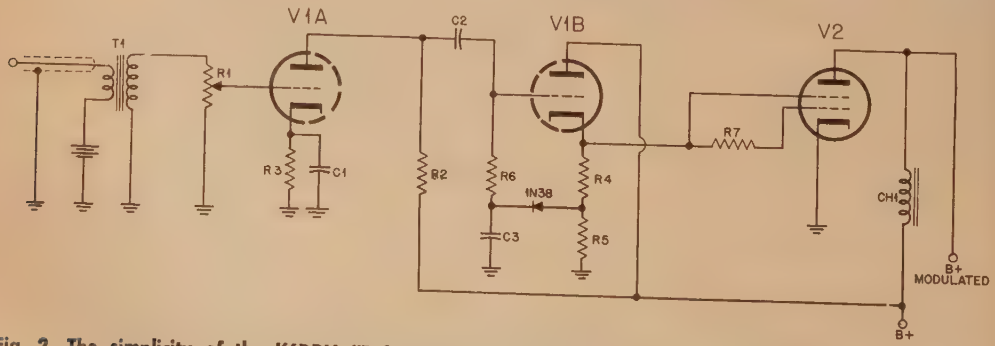


Fig. 2. The simplicity of the K6DDV "Reference shift" modulator should appeal to the mobile enthusiast. Operation data is covered in the accompanying article.

For setting the VFO, plate voltage is taken from the car receiver and fed to a 3-way intercomm switch, *SW2* in *fig. 3*. This type switch has a center off, a spring return and a locking position. In the spring-return position, voltage is routed to the VFO through a plate circuit relay, *RY3*, which closes and operates the tuning motor. In the locking position, the voltage is fed through a fixed resistance equal to the relay resistance. With this switch setting, the frequency stays put for checking on the receiver.

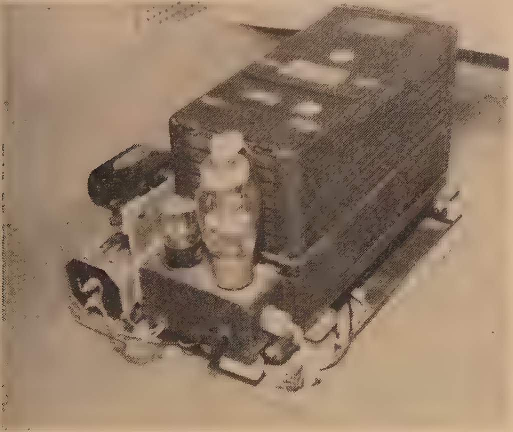
So that tuning the VFO energizes only the oscillator, a lockout relay, *RY4*, disconnects the VFO plate from the mobile power supply except during transmission. Serving in this capacity is a small, 5000-ohm relay connected as a portion of the final screen dropping resistance.

A large spark-suppression capacitor eliminates contact troubles in the motor control relay. Speed of the tuning motor is set by a series resistance determined experimentally by connecting a length of #36 wire in the motor circuit and shortening it until the desired tuning rate was reached. The wire was then wound on a 1-watt resistor as a form and soldered into the circuit.

Making it talk

The Command set's bulk often puts space for the modulator at a premium. Series screen modulation offers one "out." But remote control does not permit the close tuning necessary for linear screen operation. Plate modulation offers the right degree of latitude were it possible to put it to work in a small package.

K6DDV has come up with an excellent answer in his "Reference Shift" (op. cit) modulator. This is a variation of the Bias Shift (*CQ*, April, '54) principle wherein a Heising modulator is made to draw plate current on a demand basis, thus avoiding the heavy Class A current characteristic of the conventional Heising system. As adapted to the Command transmitter, the modulator uses two tubes, a 6SN7 and an 807. As shown in the photograph, all components except the microphone transformer and modulation choke are housed in the box portion of the transmitter rack. The iron core units are mounted on the plywood baseboard to which the transmitter is secured.



Rear view of the transmitter assembly with top cover in place. The two tubes handle speech amplifier and modulator functions. Except for modulation choke and microphone transformer, all parts are contained in the rack box.

Fig. 2 diagrams the speech system. One half of the 6SN7 functions as a speech amplifier working from a carbon microphone. The second half of the 6SN7 is the driver, cathode coupled to the 807 modulator. The latter is connected for "zero bias" operation.

The control portion of the circuit comprises a resistor-rectifier-capacity network in the driver grid and cathode circuit.

The voltage to ground at the driver stage cathode is divided by the resistor combination *R4* and *R5*. This voltage is applied to the driver grid through the 1N38 diode and grid resistor *R6*. The back resistance of the diode together with filter capacity *C3* form an RC combination which maintains the driver bias at a value proportional to one-half the d-c voltage plus one-half the peak a-c voltage present at the driver cathode.

This voltage pushes the driver grid less negative as the amplitude of the applied audio signal increases. Consequently, the positive voltage measured at the driver cathode—and the 807 grids—with respect to ground increases with a resulting increase in modulator plate current. This action is not instantaneous but follows a syllabic rate because of the averaging effect of the RC circuit mentioned above. Thus, the modulator driving signal comprises the desired audio and a positive d-c component which varies at a syllabic rate in accordance with the average amplitude of the applied speech.

With a 350-volt supply, the modulator idling plate current is under 25 ma. This kicks upward to around 70 ma with applied audio. Modulating the 35-watt final is a cinch. With a single flashlight cell furnishing mike current, full modulation is reached well in advance of maximum gain control setting.

With circuit values shown—and using a 350-volt power supply—the circuit has been completely trouble-free. A word of caution though: if a higher voltage supply is used, means should be incorporated to limit the voltage on the 6SN7 to a 350-volt maximum. Cathode to filament breakdown might otherwise occur.

Control circuits; Monitoring

The remote VFO system has already been described. "Zeroing in" on a station is done by pushing the "tune" switch *SW2* until the oscilalator beats with the desired signal. By throwing the switch to the locking position, the oscillator frequency can be checked by tuning it in on the receiver.

Schematic of the complete control system is shown in *fig. 3*. All relay functions involving the transmitter proper are handled by high-resistance relays. By connecting these into circuits where dropping resistance is required effective use is made of energy otherwise wasted. The antenna relay is in series with the oscillator plate lead from the dynamotor supply. It is mounted on a Micarta block and fastened to the inside front panel just below the coax line fittings.

Routing the receiving converter B-plus lead through *SW3* provides automatic receiver muting while transmitting. Plate voltage from the receiver is cut off from both *SW2* and the converter. However, if *SW2* is operated while transmitting, the converter will receive plate voltage from the transmitter supply. The resultant "talk back" is a quick check for modulation. Obviously, the "check" rather than "tune" position of *SW2* would be utilized for this operation.

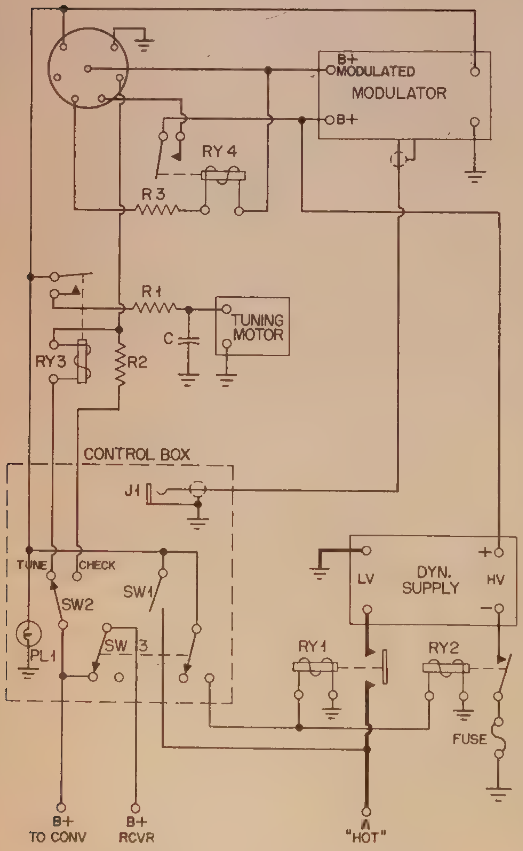


Fig. 3. Control circuits. Wiring between the dash control box and the trunk-mounted components is run through loom under the floor mats adjacent to the driveshaft "tunnel." The connector plug is as viewed from rear of chassis.

Continuous check on transmitter performance is furnished by a fixed-tuned diode field strength meter. The 0-1 ma indicator mounts on the steering column and other components are in a small utility box bolted to the firewall. The car antenna, telescoped to minimum height, supplies the pick-up. Since all adjustments are fixed, the meter indication is at all times indicative of the transmitter output.

The meter housing? An aluminum cup of the type sold at any housewares counter. This is padded with cardboard so the meter fits snugly into place. A simple double-strap bracket holds the assembly to the steering column.

Miscellaneous notes

A length of co-ax couples the transmitter output to the antenna. The coupling coil in the BC-459 final is used "as is."

Most W6 mobile activity on forty is confined to upper portions of the band. For this reason, the antenna was resonated at 7270 kc. This provides reasonably efficient operation from 7240 to 7295 kc. There is a noticeable drop in indicated field strength below 7240, but QSO-ability seems little affected. Many excellent "low end" contacts have been logged. Fixed setting of the final tank condenser corresponds to the resonant frequency of the antenna.

A rigidly-mounted, center-loaded whip has proved best of several antennas tried. The high-Q loading coil required careful pruning to plus/minus one-eighth turn. This adjustment was necessary because the whip element was stainless steel and definitely fixed length.

The base section is a 40″ length of surplus tank whip. Total antenna length is nine feet. When mounted to the rear bumper, overall height is not enough to pose a problem in normal driving. In general, the mobile antenna theories of Bassett (*CQ*, Sept. '55) have held true. It is conceded that a mounting higher on the car would increase effective radiation. But no practical way to do this without putting a spring back into the circuit has been found.

Twenty thousand miles of travel in W6, W7 and WØ call areas have been logged. On the most recent jaunt, a vacation trip to Colorado, stations in twenty-one states were worked. A credit to the designers of the little Command transmitter is the fact that not a single original part has ever failed. Perhaps the sets are actually as good as depicted in one World War II advertisement. This showed a radio set salvaged from an aircraft which had met a watery fate at sea. Today, any ham would recognize the unit as a Command transmitter. After being cleaned and dried out, so the copy stated, the set was found to operate perfectly. Could be. ■

A surplus FL-8 and 5 minutes provides the most superior conelrad monitor for Ham use yet. Total cost should run only about one dollar.

Project Conelrad

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Thumbing through the several amateur journals I have seen many and varied circuits for Conelrad monitoring. Almost all require modification of the receiver, or building a new gadget . . . or both. I don't mind building gadgets, in fact, I do just that for a livelihood, but I'd druther operate or dream up something new rather than trying to duplicate others' efforts. The method about to be described is as simple as Conelrad monitoring can possibly be and I believe its efficiency is second to none.

Far too much emphasis has been placed on "carrier break" for triggering a Conelrad alerting device. Either the receiver's AVC operates a relay or a light bulb is bridged across the voice coil.

Apparently little thought has been given to the numerous broadcast station carrier breaks which are caused by lightning, pattern-switching, equipment breakdowns, etc., breaks which will trip the AVC-operated device but which are not Conelrad alerts. An official Conelrad alert consists of 5 seconds of carrier, 5 seconds of unmodulated carrier, another 5 seconds of carrier, and then a carrier modulated 15 seconds by a 1000-cycle tone. This tone is followed by the Conelrad announcement in case of a real alert or by a resumption of normal programming in event of a test alert.

All non-key stations are required to originate one "test" alert each week. Key stations originate at least two test alerts, one at a pre-arranged time and the other as a "surprise" to non-key stations which are required to monitor the key stations, log all alerts and report weekly to FCC's Conelrad Division. *Each and every one of these alerts contains the 15 seconds of 1000-cycle tone.* Whether the carrier breaks or not is unimportant. Carrier breaks are a part of the official Conelrad plan but in an actual emergency I personally doubt if all stations would waste time breaking the carrier BUT the 1000-cycle tone *would* be there preceding the Conelrad announcement. Since Project Conelrad was first inaugurated several years ago I have known stations to broadcast the tone without any carrier breaks, whether this was accidental I do not know.

By now, if you have read this far, you are probably thinking that I am going to suggest that you build a 1000-cycle selective amplifier to install in your Conelrad receiver or that you keep your ear pinned to the radio listening for that 1000-cycle tone. (Maybe the XYL could be bribed into listening for it for you!) Well, you have guessed wrong. The answer lies in the war-surplus FL-8 filter available for a buck at almost any surplus depot. (Or contact W5QCB . . . he seems to have an endless supply.) The FL-8, when in the filter position, will pass 1020-cycles and reject, to a great degree, everything else. It passes the Conelrad 1000-cycle tone clear as a bell! When the FL-8 is in the voice position it passes normal program material with little attenuation.

To use the filter merely wire it in series with your Conelrad receiver's loudspeaker. Tune in your Conelrad station (your local or nearby station is okay). Flip the filter to "Range" position and note the drop in volume. Now adjust the volume control until program material is just audible. Changing to "Voice" position should boost the volume terrifically. Flip back to "Range" and you're in business. That's all there is to it. What could be simpler?

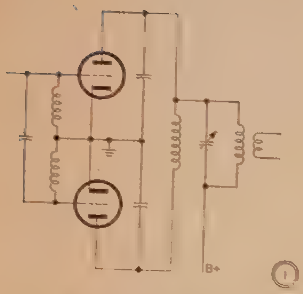
Does it work? Well, with the pot adjusted as above any Conelrad tone of 1000-cycles or thereabout will pass thru the filter and out the speaker and can be heard all over the house. To determine if it is a test alert or the real thing just flip the FL-8's switch to "voice" position and there you have the program. If the alert is the real thing you will hear the announcement to that effect and it's time to shut the rig down and hunt a hole. Otherwise, flip it back to filter and yack to your heart's content with full assurance that you have a Conelrad alerting device as fool-proof as the station to which you are tuned and the radio you are tuning it in on. To heck with the relays, shielded wires, flashing lights, and gongs. Get yourself an FL-8, quit worrying about Conelrad, and let's live a little! ■

Stolen from

AUTOCALL

So, You Think You Know Radio

Despite the fact that this feature has been stolen in toto from *Autocall,* the bulletin of the Washington Mobile Radio Club and four other Capitol area radio clubs, CQ admits no shame. The circuits below are all known by the name of the man who did the original work on them. All you have to do to qualify as an Expert 1/c is identify (without referring to page 116) ten of the fifteen. Twelve right makes you a Lieutenant (jg). Fifteen correct guesses exposes you as an uprincipled peeker into the answer page and qualifies you for a position on the CQ staff.



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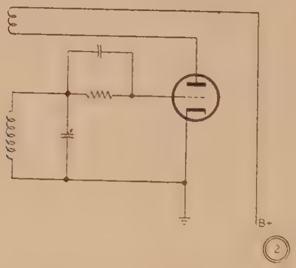

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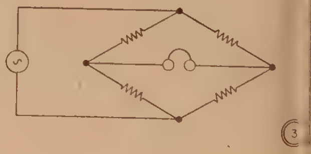

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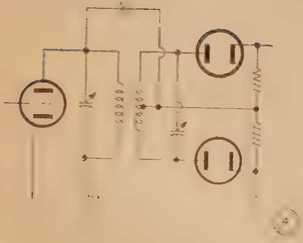

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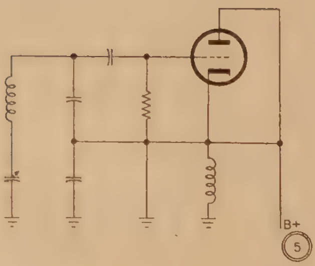

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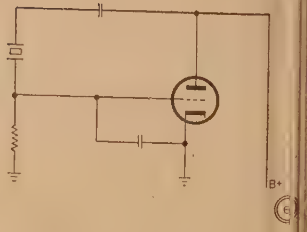

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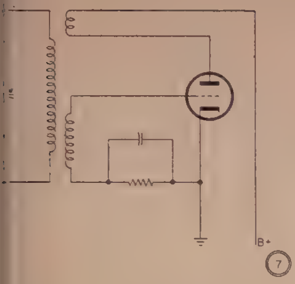

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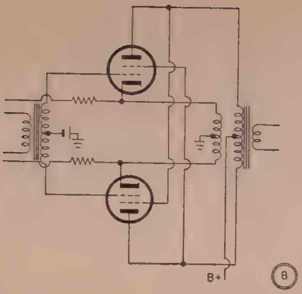

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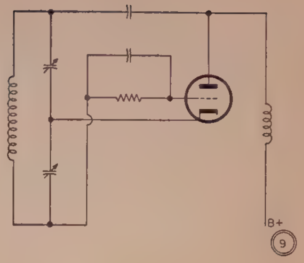

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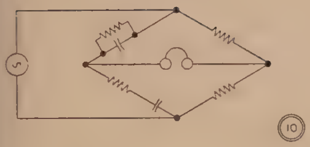

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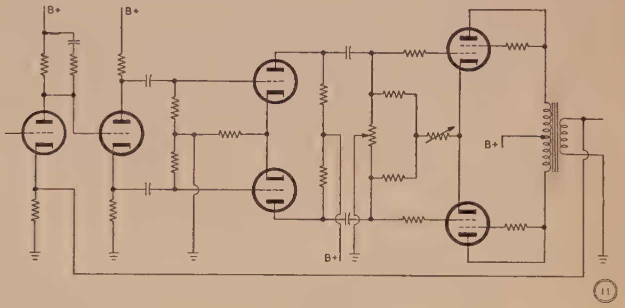

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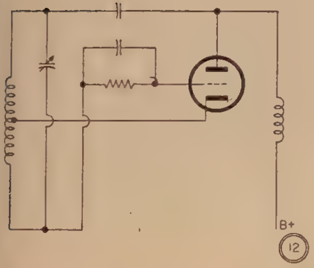

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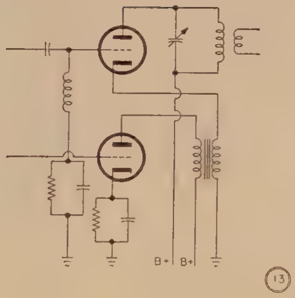

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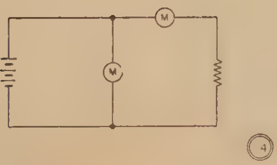

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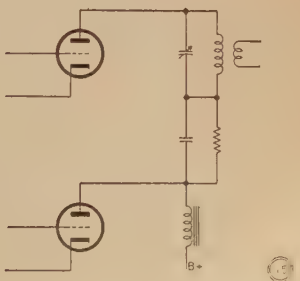


15 ....

Simple, easy, and invaluable

A New High-Stability Frequency Standar

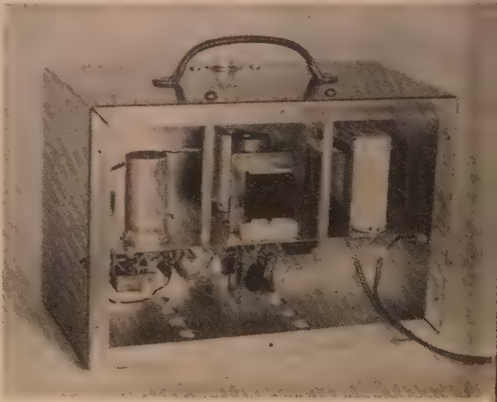
Frank H. Tooker, W2VQL
P.O. Box T
Lakehurst, N.J.

In these days of complex electronic and radio devices, a certain number of instruments are almost indispensable to the Ham and experimenter. Among these can be counted a good crystal-controlled frequency standard. The unit described in this article was designed to meet such a need. It is especially dependable because it uses the regenode principle of operation—that is, a cathode follower working into an amplifier with a fraction of the output of the latter being fed back into the cathode follower to provide regeneration.

The regenode principle of operation was chosen because it had already proved of value in regenerative receiver service ("The Regenode"—Tooker, *Popular Electronics,* January, 1956). The inherent high stability and excellent sensitivity of this circuit, together with the fact that its input is at a very high impedance and operates class-A, indicated that it might well find application in something a little more worthy. The result is a 500-kilocycle frequency standard with excellent output level and considerably better than average stability.

The Circuit

The circuit of the frequency standard is shown in *Fig. 1.* The oscillator tube is the twin-triode *6BK7A.* Aside from its high transconductance, which is of considerable value i cathode-follower applications, this particula tube was chosen because it is intended to b operated with its cathode above ground poten tial. Section *V1A* is connected as the cathod follower, and section *V1B,* the amplifier. Th positive feedback loop, which provides regen eration, consists of *R6, C1, C2,* the crystal, an *R1.* Zero-temperature coefficient, silver-ceram capacitors are used at *C1* and *C2.* Silver-mic units may be substituted, if desired. The u of "garden variety" capacitors at this poi should be avoided, however, since they ma cause frequency drift, unstable oscillations,

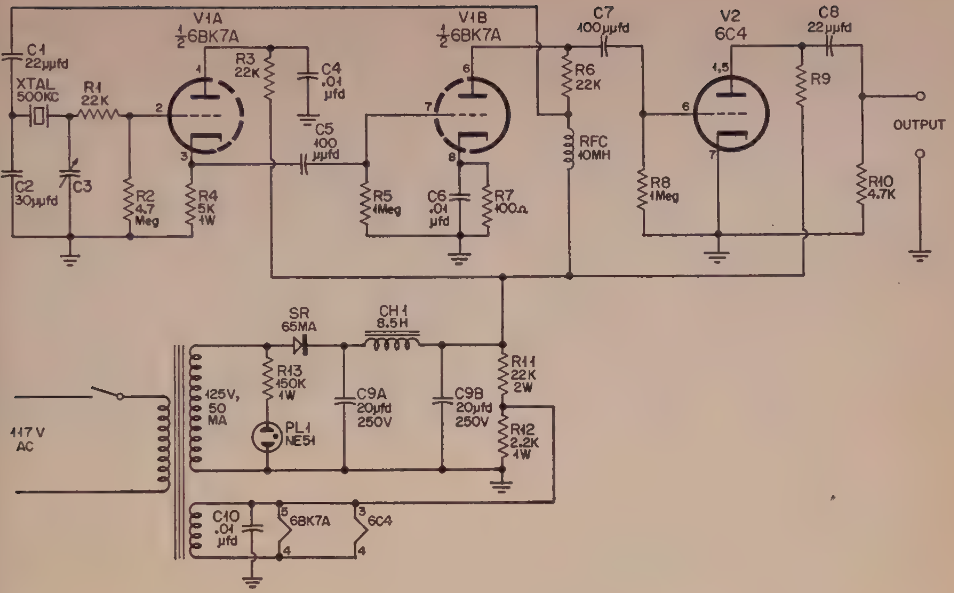


Back view, cover off.

Front view

even no oscillations at all. Resistor *R4* is precision, low-noise unit with excellent f quency characteristics, although a regular 47 ohm, 1-watt resistor might be used here wi out causing noticeable ill effects. The remain of the capacitors and resistors are conventio ceramic and composition types.

By far the majority of more-conventio crystal oscillators operate class-C, that is, control grid draws current and thus consu power. Because the crystal is connected in grid circuit, the power consumed by the g in such oscillators must be supplied by crystal. This is an undesirable state of aff because the frequency stability of a crysta largely determined by its extremely high Q, quality-factor. Connecting it into a pow hungry grid circuit loads the crystal, destr a certain amount of its Q, makes it work har



Complete schematic

nd thus causes its frequency stability to be ower than would be realized under more avorable circumstances. Furthermore, the rystal must be tighly coupled to the oscillator ube to provide a low impedance path for the ransfer of power from the crystal to the rid. Because of this close coupling, any varia-on in the oscillator grid capacitance or im-edance will cause a corresponding shift in the rystal's frequency of oscillation, and changes n plate or filament voltage will have a similar ad effect. Thus frequency stability is made ven lower.

In the regenode circuit, the input grid does ot draw current. Thus the input impedance of *1A* is very high, and a crystal connected here will not be required to deliver power. It operates virtually unloaded. Additionally, a relatively high value of resistance, *R1*, may be inserted between the crystal and the grid of the tube to isolate the crystal and make its frequency of oscillation largely independent of slight changes in tube characteristics and filament and plate voltage variations. Feedback requirements are small, so a similar resistor, *R6*, may be inserted between the plate of the amplifier, *V1B*, and the other side of the crystal.

The mode of operation of the amplifier, *V1B*, is relatively unimportant. Under the design conditions, any power required by the grid of this tube, for class-B or class-C operation, is quite easily supplied by the cathode of *V1A*.

Parts List

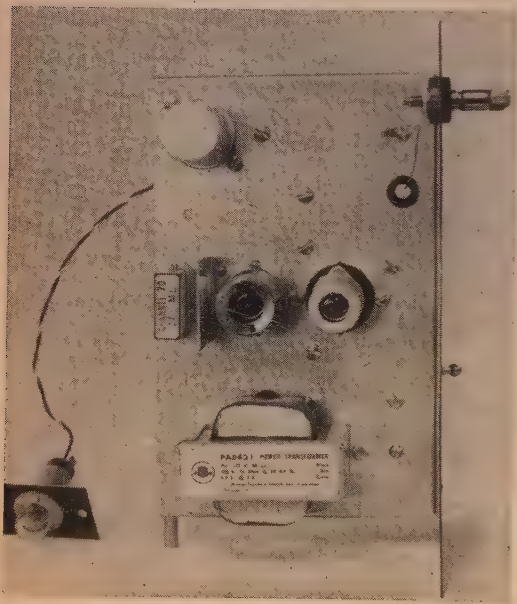
1, R3, R6—22,000 ohms, ½ w. composition resistor
2—4.7 megohm, ½ w. composition resistor
4—5000 ohms, 1 w. resistor, I.R.C. DCF Precistor or equal
5, R8—1.0 megohm, ½ w. composition resistor
7—100 ohms, ½ w. composition resistor
9—0.1 megohm, ½ w. composition resistor
10—4700 ohms, ½ w. composition resistor
11—22,000 ohms, 2 w. composition resistor
12—2200 ohms, 1 w. composition resistor
13—0.15 megohm, 1 w. composition resistor
1—22 μμfd. zero-temp. coefficient, silver-ceramic or silver-mica capacitor
C2—30 μμfd. zero-temp. coefficient, silver ceramic or silver-mica capacitor
C3—100 μμfd. midget variable capacitor, ceramic insulation, screwdriver adjusted
C4, C6, C10—0.01 μfd. ceramic by-pass capacitor
C5, C7—100 μμfd. ceramic capacitor
C8—22 μμfd. ceramic capacitor
C9—20/20 μfd., 250 v. dual electrolytic capacitor, Sprague TVL-2515 or equal

R.F.C.—10 millihenry choke
XTAL — 500-kilocycle quartz crystal
VI—type 6BK7A tube
V2—type 6C4 tube
CH1—8.5-henry, 50 ma. filter choke, Stancor C1279 or equal
T1—Power transformer, 125 v. at 50 ma., 6.3 v. at 2 amp., Stancor PA-8421 or equal
SR1—Selenium rectifier, 65 ma., 130 v., Federal 1002 or equal
PL1—neon lamp NE-51, in dome-type pilot light assembly, similar to Dialco series 95408 (R13 may be changed to 0.1 megohm, or even deleted, if one of this particular series is used)
S1—s.p.s.t. toggle switch
1—steel chassis deck, 7¾" x 6½", Bud CB-528 or equal, cut down (see text)
1—aluminum box, 5" x 6" x 9", Bud AU-1040 or equal
1—ceramic crystal socket
1—min. 9-pin turret-tube socket, shield base, and shield
1—min. 7-pin tube socket with shield base and shield
1—binding post-terminal strip, 2 posts, National FWH or equal
4—¾" x ⅛" sponge rubber discs for cabinet feet
1—power cord
1—screen door pull for handle

Miscellaneous hardware, scrap aluminum for crystal heat shield, snap-in hole plug, rubber grommets, tie points, decals for lettering, wire, solder, etc.

Approximate catalog price of parts, $25.00

The circuit shown in *Fig. 1* is such that *V1B* operates class-A (no grid current) at very small signal levels, and changes to class-B (moderate grid current) at higher signal levels. The values of *R5, C6, R7, R6, C1, C2, R1*, and *R4* in *Fig. 1* are so proportioned that the output from the oscillator, taken at the junction of *R6* and *C7*, remains substantially independent of the voltage level at the grid of *V1A* over the range normally encountered in the circuit. Aside from the obvious refinement of having nearly constant output voltage from the oscillator, this proportioning was considered desirable (1) because it appears to improve frequency stability to a certain extent and (2) because the voltage level at the grid of *V1A* varies considerably over the range of settings of capacitor *C3*. *C3* is not intended as a feedback control, however. Its primary function is to shift the frequency of oscillation of the crystal slightly in order to make one of its hamonics zero beat with a primary frequency standard, such as, for instance, the carrier of the Bureau of Standards station, WWV. *C3* must be a high-quality unit with all-ceramic insulation and, if possible, a silver plated rotor and stator, since any drift in the capacitance or power factor of this unit will adversely affect the frequency stability of the crystal.



Top of chassis

The biasing components, *R7* and *C6*, in the cathode circuit of *V1B* are also helpful in aiding the start of oscillations in hard-to-drive crystals. This relatively small bias allows *V1B* to operate class-A at the beginning of oscillations, thus completely unloading even the cathode of *V1A*.

The 500-kilocycle crystal is one of three purchased as surplus at $1.99 each from U. S. Crystals, Inc., Los Angeles, California. Al three crystals were found to operate well in this circuit. Incidentally, if you buy more than one crystal, try them all, and use the one giving the highest amplitude at the grid of *V1A*. This one has the highest Q, and will give the best frequency stability. All three crystals, as purchased, were a small fraction of a kilocycle high in frequency, as is normal for frequency-standard crystals. Adjusting *C3* in the direction of increased capacitance *decreases* the frequency of oscillation of the crystal.

If the standard is kept in continuous operation it will be found that the crystal frequency drifts slightly with the passage of time. Most of this drift occurs during the first two or three weeks of uninterrupted operation. It has been the author's experience that by far the majority of crystals drift lower in frequency with aging, so don't get worried or excited right away if full or nearly full capacitance is required at *C3* at the beginning of operation!

Some 500-kilocycle crystals will oscillate in this circuit when *C1* is made as small as 10 μμfd. About a second or so is then generally required for the crystal to build up to full oscillation, indicating that the feedback is just about at minimum. It is not recommended that *C1* be so decreased, however, since a few crystals will not oscillate at all under such conditions, and the output amplitude will vary with both the setting of *C3* and changes in line voltage.

If a crystal ground for a fundamental frequency other than 500 kilocycles is to be used, it will quite likely be necessary to change the value of the feedback components if optimum operation is to be realized. For instance, it was found necessary to increase the feedback for optimum operation with a 200-kilocycle crystal. The crystal oscillated without changing component values, but the leveling-off feature was lost until feedback was increased. This is to be expected, of course, since (1) the reactance of the r-f choke in the plate circuit of *V1B* decreases with decreases in frequency and, (2) in general, lower frequency crystals are usually more difficult to drive. No checks were made with a 1000-kilocycle crystal since a unit with pin spacing to fit the crystal socket was not on hand at the time.

The voltage output from the oscillator is quite high—estimated at 10 to 15 volts R.M.S. —a nice condition to have along with an isolated class-A crystal circuit! It is connected through a capacitor, *C7*, to the grid of a simple harmonic generator using a type *6C4* triode tube, *V2*. The waveform at the standard's output terminals, as displayed on a *Heathkit 0-10* oscilloscope, is shown in one of the photos. It is heavily clipped and rich in harmonics up to at least 30 megacycles—the highest frequency at which checks were made. Decreasing the value of *R10* will cause the crest of the wave

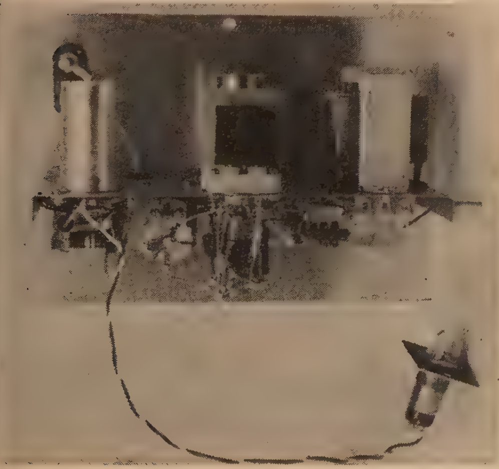
Output waveform

so approach more nearly a square form, while increasing *R10* makes it approach a sawtooth. The value of 4700 ohms given in the parts list is about right from the point of view of optimum harmonic generation and adequate output voltage. The output from the oscillator alone is for all practical purposes a sine wave at maximum capacitance in *C3*, and approaches a sawtooth at minimum capacitance in *C3*, indicating the shift of operating conditions in *V1B*.

Construction

Every frequency-determining device — whether it be one of the oscillators in your receiver, a V.F.O. for your transmitter, or a secondary frequency standard such as this—needs to be rigidly constructed. A steel chassis, tight, well-fitted screws with lockwashers, and short, direct leads on all components are a necessity if the frequency is going to stay put day in and day out—as you'll want it to. The unit shown in the photos is built on a 7¾″ X 4¾″ chassis deck which was made by cutting down the standard 7¾″ x 6½″ part specified in the parts list. It is enclosed in a 9″ x 6″ x 5″ standard aluminum box which, after cutting and drilling were finished, was sprayed machine grey using one of the handy pressurized containers available almost everywhere. The louver plate on the back cover was cut from the side of an old surplus cabinet and bolted into a rectangular opening cut to fit it. A standard *ICA 3525* louver plate may be used instead. Louvers are preferred because they permit ventilation without admitting a lot of dust. A series of ½-inch diameter holes cut in the underside of the box completes the ventilating system.

Rear view of chassis



A *Vector* 9-pin turret socket is used for the *6BK7A* tube. Components *R2, R3, R4, R5, R6, R7, R8, C4, C5, C6* and *C7* mount conveniently and neatly on this socket. All other components are mounted point to point or on tie-point strips. The r-f choke is mounted clear of the remainder of the oscillator components to prevent any undesired coupling. A bracket cut from the removed part of the chassis mounts the variable capacitor, *C3*. The little black plate holding the tube socket for *V2* is the result of trying a somewhat more elaborate harmonic generator using a tube with a 9-pin socket. It didn't work much better than the simplified circuit, so the 7-pin *6C4* was replaced —necessitating the little black plate to mount the tube. If the author had stayed with the *6C4*, which he had put there in the first place, the plate wouldn't have been needed!

The power supply is run-of-the-mill except for resistors *R11* and *R12* which perform the dual function of bleeder and providing a potential of about 15 volts to bias the filament line. This biasing makes the heaters more positive than the cathodes of the tubes, thus helping to prevent hum which might otherwise be developed, especially in the cathode follower.

Above deck, the only really interesting feature is the little polished aluminum shield between the crystal and the oscillator tube. This shield helps to prevent frequency drift by deflecting the heat of the oscillator tube away from the crystal housing. The shields over the tubes aren't really necessary, so if you want to save a few cents you can do away with them.

The chassis is rigidly mounted in the cabinet by means of two vertical posts, made from ¼″ O.D. aluminum tubing tapped at each end for 8-32 screws, and two spacers, one at each side of the rear of the chassis, between the side lips of the chassis deck and the walls of the box. These are made from the same material used for the vertical posts and have 1″ x 6-32 screws running through them, with nuts and lockwashers on the inside lips of the chassis. Both the posts and the spacers were cut slightly longer than necessary and then carefully filed

[*Continued on page 114*]

Part 3 of a series Using Printed Circuit Techniques

SSB Crystal Filter

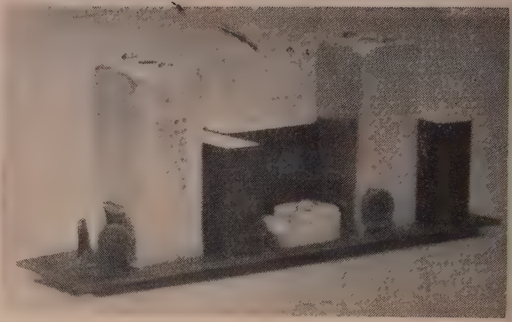


Fig 1—The single sideband crystal filter is assembled in a minimum of space by eliminating crystal sockets, and by mounting all parts in close proximity for direct etched circuit board interconnections. Ceramic trimmer condenser, C_3 is visible in the enter forground.

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Among the principal advantages of etched circuit boards is their effectiveness in the unitization of electronic equipment. In some cases this unitization conserves space and in most cases it improves accessibility and identification of parts for maintenance purposes. If unitization is desirable for these reasons, it is doubly desirable in amateur constructed equipment where frequent modifications and additions are usually made.

Use of Crystal Filter

Edmunds type single sideband exciters, which have justified considerable popularity in recent years, require a narrow passband filter capable of passing one sideband while rejecting the other sideband and the carrier. Likewise, in several receiver applications, such a filter may be used within the intermediate frequency amplifier stages to advantage. While the ultimate merits of a crystal bridge filter, whether simple as shown here or of manifold complexity, have not been conclusively described in comparison to a mechanical filter or even the phasing method of SSB generation, it is safe to assume that the economical aspects of the war surplus crystals involved will continue to make them attractive to many experimenters for some time.

Upon careful study of the operation and adjustment of crystal filters, as described in the available literature, their employment may be undertaken with the greatest assurance of successful performance.

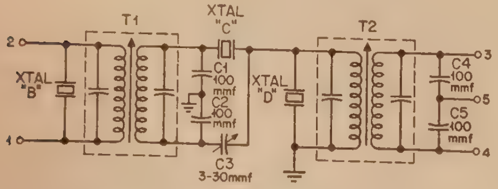


Fig 2—Wiring diagram for the printed circuit SSB filter utilizes the conventional Edmunds crystal filter network. T_1 and T_2 may be tuned either by powdered iron slugs or by mica trimmers, depending upon selection of transformers.

Circuit

Fig 2 will be recognized as a conventional bridge type filter with tuned input and output circuits. Input legs of the bridge are the 100 mmfd condensers, C1 and C2. Although ± 10% tolerance units may be used here, they may, in some cases, have to be individually selected if balance cannot be achieved with trimmer, C3. Output legs of the bridge consist of crystal "C" and trimmer condenser, C3, which balances out the internal and lead capacity of the crystal.

Inasmuch as quartz crystals of the type used in this single sideband filter have a sharply pronounced series resonant frequency, this phenomena may be advantageously employed in two ways, ie: in series—to pass, and in parrallel—to short-out or reject. Therefore series crystal, "C", is selected to pass the desired nominal frequency, and crystals "B" and "D", which are in parallel with the signal are chosen to reject certain frequencies adjacent to the nominal pass frequency.

Tuned circuits comprising the primary and secondary of transformers T1 and T2 act to "round-off" the sharp characteristics presented by the crystals.

Type FT-241A war surplus crystals are utilized because of their favorable cost. Those crystals having three-digit channel markings are desired because their fundamental frequencies are approximately 1.4 kc apart. A typical table of relative frequencies and channels for ten possible combinations is shown at the left of *fig 7*. The right hand table in *fig 7* is included for information purposes. These two-digit channel numbered crystals have fundamental frequencies which are approximately 1.9 kc apart. This separation is too great for the standard three-crystal Edmunds filter. However, information contained in the right hand chart should assist when it becomes necessary or desirable to select from both 2 and 3 digit crystals to make up a matched set. In addition, if it is desired to produce a steeper band pass curve with greater attenuation at the skirts, additional crystals having either 2 or 3 digit markings near those of crystals "B" and "D" may be connected in parallel with the input and/or output of the filter.

Alignment

Individual crystals should be checked and their frequencies verified by the method shown in *fig 6* before soldering them in place on the etched circuit board. Alignment of the completed filter should follow the procedures described in the *CQ* or *ARRL Single Sideband Handbooks.* If a signal generator with adequate output (3-8 volts) is available, the complete filter may be aligned prior to installing it in an SSB exciter.

Changing Crystal Frequency

Experience has shown that the FT 241A crystals are quite easily damaged by movement of the short wire leads which are soldered directly to the silver plating on the crystal blank. It is interesting to note that these leads are factory-soldered in an accurate positioning jig by a blast of hot air. Therefore, when handling the crystal in grinding its edges, due care should be exercised to avoid breaking these critical connections.

A close inspection of the type FT 241A crystals will disclose that conventional contact plates are not used. In their place, silver is plated on either side of the crystal blank and a fine wire soldered at right angles to the plating as shown in *fig 5.*

Because the flat faces of the crystal are not exposed for grinding as is usually done, increases in frequency are made by lightly grinding the edges. This must be done evenly

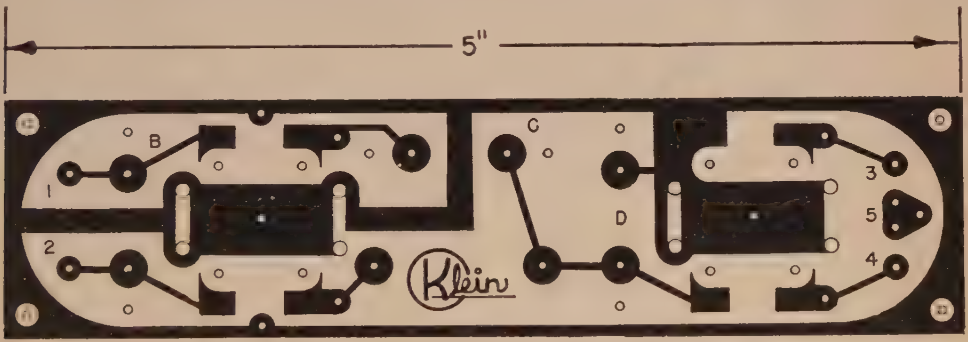


Fig 3—Master drawing of etched circuit board for SSB crystal filter is shown full size. Photoengraving negatve for this relatively simple design can be made by photography or by handcutting a mechanical negative.

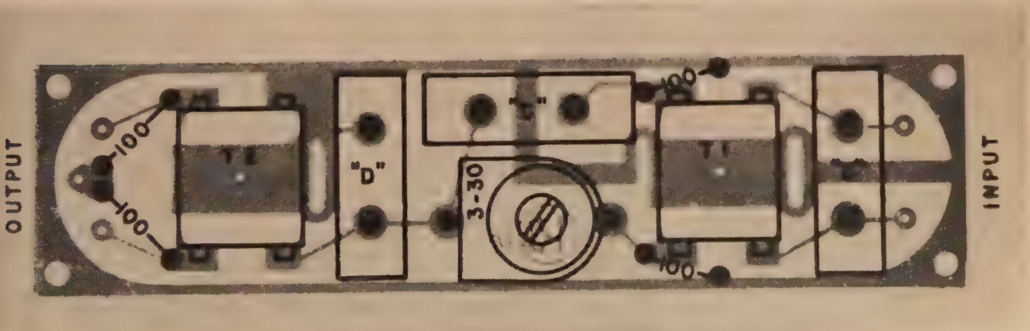


Fig 4—Phantom view showing placement of parts on the face of the etched circuit board. Input and output terminals may be reinforced with hollow rivets if repeated connection and disconnection is anticipated.

Basic Frequency Crystal "A"&"D"		Crystal "B"		Crystal "C"	
Kc.	Channel	Kc.	Channel	Kc.	Channel
447.2	322	450.0 444.4	324 320	445.8 448.6	321 323
448.6	323	451.4 445.8	325 321	447.2 450.0	322 324
450.0	324	452.8 447.2	326 322	448.6 451.4	323 325
451.4	325	454.2 448.6	327 323	450.0 452.8	324 326
452.8	326	455.6 450.0	328 324	451.4 454.2	325 327

Basic Frequency Crystal "A"&"D"		Crystal "B"		Crystal "C"	
Kc.	Channel	Kc.	Channel	Kc.	Channel
446.3	41	450.0 442.6	43 39	444.4 448.1	40 42
448.1	42	451.9 444.4	44 40	446.3 450.0	41 43
450.0	43	453.7 446.3	45 41	448.1 451.9	42 44
451.9	44	455.6 448.1	46 42	450.0 453.7	43 45
453.7	45	457.4 450.0	47 43	451.9 455.6	44 46

Fig. 7—Crystal table used to assist selection of surplus crystals for SSB filters. Typical relationships are shown for crystals in the vicinity of 450 kilocycles.

on both edges, with care being taken to keep the edges square. It is recommended that the support wires be carefully unsoldered from the pins at the bakelite base for such grinding operations.

In laying out the circuit board particular attention has been given to minimizing coupling between the input and output circuits. The full size pattern in *fig 3* may be reproduced on the etched circuit board in a number of ways which have recently been described in *CQ*. It will be noted that the i-f transformers used in this filter are of the standard broadcast receiver type rather than those specifically designed for printed circuits. If it is desired to modify the circuit pattern to accommodate the latter type, either the *Merit* type 356 or 357 transformers, or the *J. W. Miller* type 13-PC1 or 13-PC2 transformers may be used. When using the 455 kc variety of transformer in the SSB crystal filter, either the input or output type may be used with equal effectiveness.

Of course, the etched circuit single sideband crystal filter will not function by itself. However, when used in conjunction with the other portions of a crystal type SSB exciter, it should be expected to hold up its end in making for over all satisfactory operation. Without doubt, this neat compact unit is one noteworthy example of good printed circuit application. ■

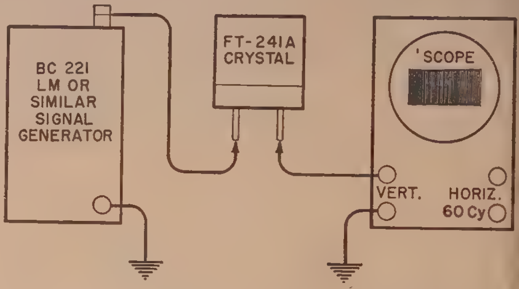


Fig. 6—Test set-up for measuring crystal frequency. VTVM with RF probe may be used in place of the oscilloscope.

NOTES

1. Crystals for the SSB filter should be chosen from the left hand table (3 digit channel numbers) to obtain approximately 1.4 kc channel separation at the basic frequency.

2. Depending upon crystal availability and basic frequency relationship, some crystals (2 digit channel numbers) in the right hand table may be used. These have approximately 1.9 kc separation.

3. Typical recommended combinations for crystals "B," "C" and "D" are shown at, above and below the nominal design frequency of 450 kc. Other combinations within channels 306 and 353 (channel 29-64 for 2 digit series) may also be used with 455 kc i-f transformers.

4. The upper numbers shown for crystals "B" and "C" are for upper sideband rejection; lower, for lower sideband rejection.

5. Channel number markings on FT-241A type crystals indicate 72 or 54 times the basic or fundamental crystal frequency, thus:

72 × 450.0 kc = 32.4 mc = Channel 324
54 × 450.0 kc = 24.3 mc = Channel 43

6. Crystal "D" is the same frequency as the low frequency local oscillator crystal, "A." Careful selection for uniformity must be made as described in the text.

Fig 5—Access holes through the etched circuit board allow removal of the crystal covers for inspection of the tiny crystal wafers. Transformer cans are also removed in this photograph to show the variable cores around the transformer windings.

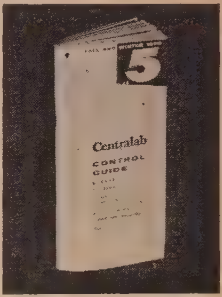
New Products

Conelrad

Conelrad Monitor, all ready to hook to your radio, for $14.95. Ameco has a catalog sheet available to give you the reasons why they went into this venture. Circle A on page 126 and we'll get them busy.

Hammarlund HQ-110

This amateur-band communications receiver has twelve tubes, double-conversion, built-in 100 kc calibrator, automatic noise limiter, separate linear detector for SSB and cw, built-in Q-Multiplier, etc. Costs $229. The all-bandspread tuning covers 6, 10, 15, 20, 40, 80 and 160 meters. Circle B on page 126 and Hammarlund will get you some info.



Volume Control Guide

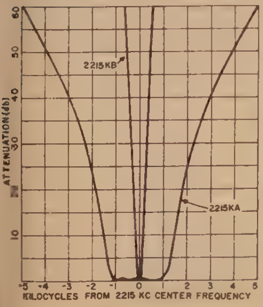
Centralab has just come out with a new edition of their Control Guide (No. 5) which if you play it shrewd and squander a quick 20c will give you 106 pages of hot control info to carry around in your inside packet. Their dealers are all loaded down with 'em waiting for you. Lazy? Write Centralab, 900 E. Keefe Avenue, Milwaukee 1, Wisconsin, and swamp them with twenty-cent pieces.

Hammarlund HC-10

Frank Lester W2AMJ and the boys at Hammarlund have come up with a real dandy this time, a real shrewd idea. One of the things that makes our high priced receivers so fantastically high priced is all the gadgets that are hung on it starting at the second detector. So why not build up a unit which has all of the fixings to bring the older or less expensive receivers up to snuff? This $149 converter contains its own power supply and audio system and merely plugs into the last i.f. of your receiver (450-500 kc). From there on you get selectivity in almost any degree you want, passband tuning, bfo, noise limiting, squelch, variable avc, etc. If you want to investigate this circle C on page 126.

New Heathkit

Ranges from 0—0.01 to 300 v ac rms and -52 to +52 db on this ac VTVM. Essentially flat from 10 cps to 200 kc, 1 meg input impedance. Fine for any lab, hi-fi bug, hamshack, etc. Particularly etc. Circle D on page 126 and Heath will find out of your interest in their Model AV-3. They're a live wire outfit and may follow up with literature.



New Crystal Filter

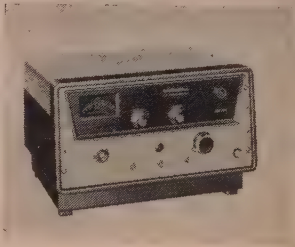
Here is a filter that you will be seeing in receivers before long. There are two models just announced, one for phone (2800 cycles @ 6 db points) and one for cw (250 cycles at 6 db points). Both work at 2215 kc. Selling price for either is $44.50. There's lots more of interest about these crystal i.f. filters, circle I on page 126 and become an expert. Hycon Eastern, Inc., are the proud parents.

Free Conversion Chart

In these stark days of cash and carry it is heartening to be able to announce something that is for free. Of course Precision will probably be sorry they got conned into this when they see how many of us hams are well trained free-loaders. Write Precision Equipment Co., 3716 N. Milwaukee Ave., Chicago 41, Illinois and ask for the free Wall Chart of Conversion Factors. Better than you thought, eh? A *Wall* Chart. It is loaded with watts to H.P., inches to cm., microns to meters, lbs to mph, and such.

Linear Amplifier

Hallicrafters HT-33 is a kilowatt amplifier which needs only about 8 watts drive (PEP) to run the legal limit. While designed primarily as a companion piece to the HT-32 SSB generator, this linear will work with any of the popular SSB exciters. If you've a mind to run AM through it that works fine too, but let's leave Hallicrafters something to tell you about the HT-33 when you circle E on page 126. If you make the circle carefully they may let you know what the final tubes are in the amplifier.

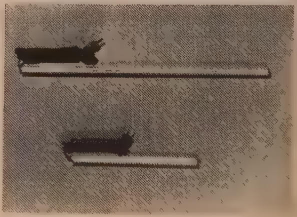


Twin Tetrode

Amperex has just announced a new and important tube for you VHF'ers . . . the 6939, a miniature 9-pin base twin tetrode which will deliver 5½ watts output (ICAS) up to 500 mc. Data? Circle F on page 126.

Damp Chasers

What makes those modulation transformers start spitting sparks? Lost any plate transformers lately? Sure, all of us have had miseries due to moisture getting into our rigs, TV sets, receivers, etc. The Damp-Chaser, Inc. gadget is a low wattage electric heater ($4.95 up) with a hundred uses. If you don't believe that DC, Inc. has thought up 100 uses then circle G on page 126 and we'll have them send you a list of 100 uses, pictures, and all like that.

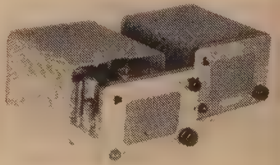


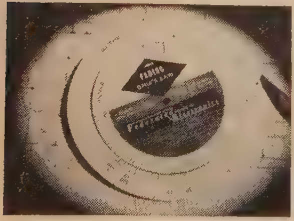
Who Needs Surgistors?

Wuerth Tube Saver Corporation is firmly convinced that *you* do. They are banking their all on this premise and are anxious to get their message across. If you circle H on page 126 you will find out how the Surgistor is like a combination resistor and relay which is connected in the power line to limit the inflow of current to the filaments, etc., to make for much longer life for your tubes, and then once warmed up it turns on the full line voltage.

Fixed Frequency Mobile Receiver

This new $97.50 mobile receiver isn't ham gear, but a lot of you fellows will be interested to see what W6ZUX is marketing. It is xtal controlled from 30-50 mc and is available for either AM or FM. Police, ambulance, utilities, towing, forestry, etc., will find it a dandy. Why not flabbergast Seeley Electronics, 1060 South La Brea Avenue, Los Angeles 19 California and write 'em about it. Mention CQ on your first order.





FREE Calculator

Federated Purchaser, Inc., with branches in New York, Newark, Mountainside, N. J., Allentown and Easton, Pa., and Los Angeles is trying to raise their floor traffic by giving away some calculators. They will be giving away a different type each month . . . ohm's law . . . db/current . . . reactance vs frequency . . . etc. All you have to do is stop by one of their six stores and grab one. Let's descend upon them like locusts, eh? We'll teach them to give something away for FREE.

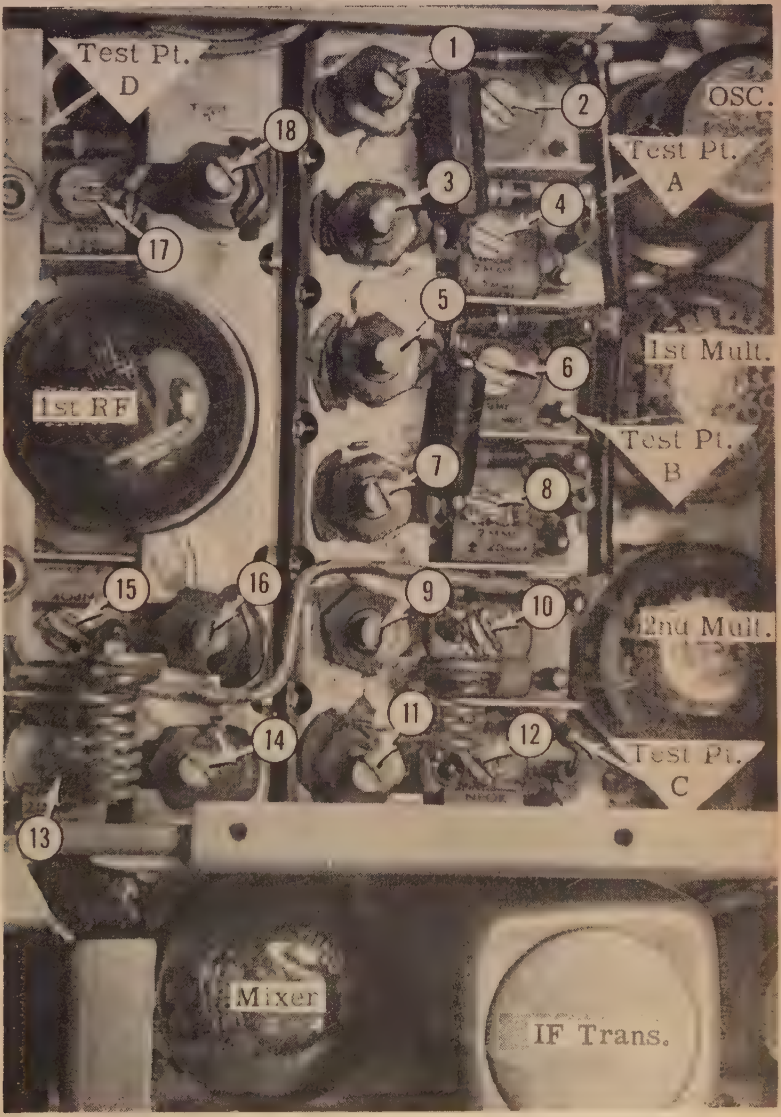
SURPLUS

Donald L. Stoner, W6TNS
P. O. Box 137
Ontario, California

Due to a colossal blunder on my part I was unable to get the "bugs" out of a conversion, for this month. Right at the last minute everything went wrong, including me, and fuses blew all over the place especially at CQ.

With any luck we'll have it for you next month but the way it looks right now, that darned thing may never work!

Rather than leave a gap where the surplus column usually resides, I desided to pass along some information to you that was sent to me some time ago. This conversion was worked out by Lt. William B. Kincaid of the Civil Air



Close-up photo by Lt. William B. Kincaid (CAP)

Patrol, 1630 West Clinch, Knoxville, Tennessee. This receiver makes an excellent companion unit to the T-23 transmitter that was featured in the April 1957 issue of CQ.

The R-28, ARC-5 for Two Meters

The ARC-5 VHF receiver, properly converted for CAP channel 7, will equal the performance of almost any commercial receiver. The receiver consists of a 717A rf amplifier (an octal 6AK5), three stages that make up the crystal oscillator-multiplier (2- 717A's and 1- 12SH7), a 717A mixer, two stages of i.f. (2- 12SH7's), a 12SL7 as a squelch amplifier-audio amplifier, a 12SL7 detector-AVC and squelch rectifier, and last but not least a 12A6 as the audio amplifier. The oscillator-multiplier has an output frequency that is 24 times the crystal frequency. The i.f. is 6.9 mc but it is tunable from 6.8 to 7.2 mc and thus a crystal between 5880 kc and 5890 kc can be used to receive the CAP frequency of 148.14 mc. Any crystal between 5712 and 5880 kc may be used to receive the two meter band without modifying the i-f. To find out what crystal you need to receive a particular frequency, first subtract 6.9 mc from that frequency. Then divide the answer by 24 and there you have it. As an example, to receive 148.14, subtract 6.9 mc giving you 141.24 mc. Then divide this by 24 and you arrive at a crystal frequency of 88. The same thing applies for two meter frequencies. The high stability of the R-23 makes it a natural for two meter C.D. work.

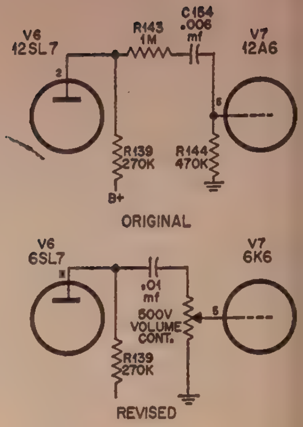


Fig. 2. Audio modifications as described in the text.

For mobile operation the volume control can be omitted and an I or T pad used to control the volume by connecting it to the speaker line. This eliminates the necessity of using a shielded cable to remote control the volume. The squelch circuit employed is an excellent one. In fact it will even trip on signals that are too weak to copy. Also by setting the squelch to the critical point and tuning the i-f's, the r-f and oscillator adjustment for maximum volume on a weak signal and excellent alignment of the receiver may be obtained.

Power requirements for the R-23 are 250 volts at 75 ma. and 6 volts at 2.5 amps. The Heath VP-1A should make an excellent power supply for mobile operation. Do not exceed 250 volts on the set because of the capacitor

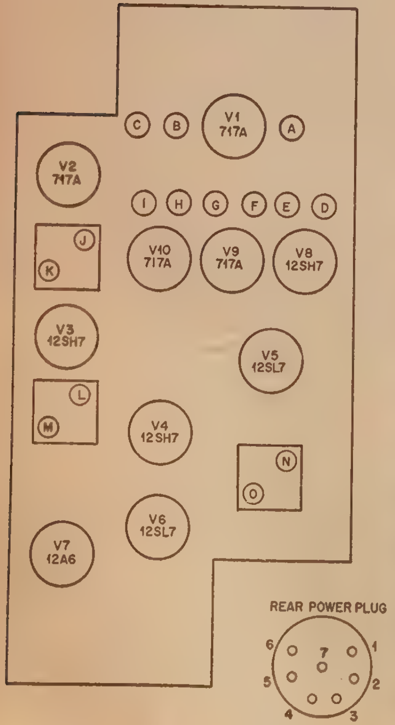
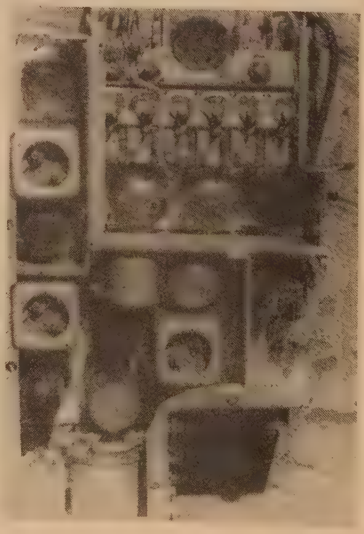
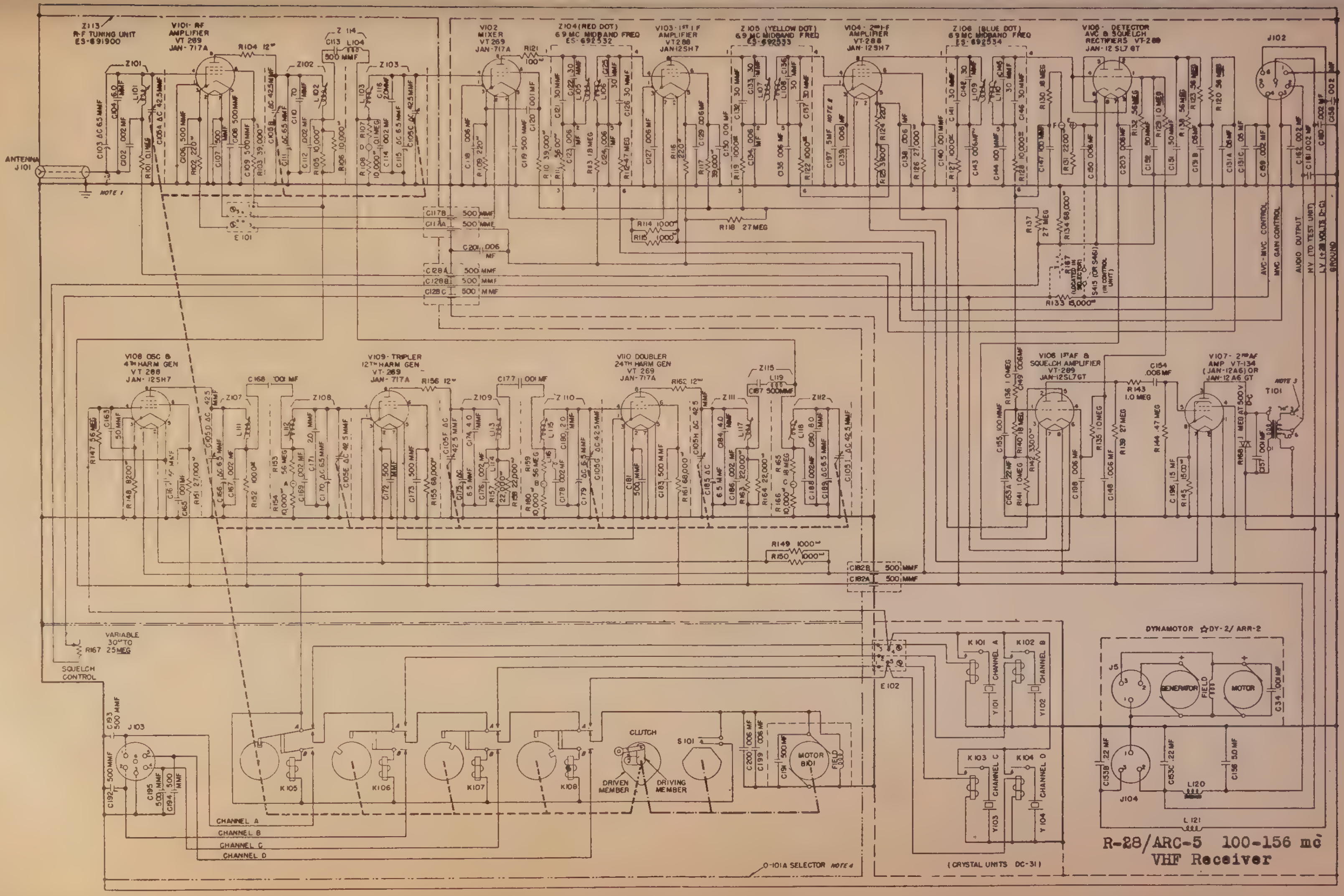


Fig. 1. Side view of the VHF/ARC-5 receiver.



Schematic diagram of the R-28 VHF ARC-5 receiver. →


Z113 R-F TUNING UNIT ES-691900
V101- RF AMPLIFIER VT 269 JAN- 717A
ANTENNA J101
NOTE 1
Z101
Z102
Z103
Z114
E101
V102 MIXER VT 269 JAN-717A
Z104 (RED DOT) 6.9 MC MIDBAND FREQ ES-692532
V103- 1ST I F AMPLIFIER VT 288 JAN 12SH7
Z105 (YELLOW DOT) 6.9 MC MIDBAND FREQ ES-692533
V104- 2ND I-F AMPLIFIER VT-288 JAN- 12SH7
Z106 (BLUE DOT) 6.9 MC MIDBAND FREQ ES-692534
V105- DETECTOR AVC & SQUELCH RECTIFIERS VT-289 JAN- 12 SL7 GT
J102
AVC-MVC CONTROL
MVC GAIN CONTROL
AUDIO OUTPUT
HV (TO TEST UNIT)
LV (+28 VOLTS D-C)
GROUND
S415 (OR S461) (IN CONTROL UNIT)
R118 27MEG
R133 15,000
V108 OSC & 4TH HARM GEN VT 288 JAN- 12SH7
V109- TRIPLER 12TH HARM GEN VT- 269 JAN- 717A
V110 DOUBLER 24TH HARM GEN VT 269 JAN- 717A
Z107
Z108
Z109
Z110
Z111
Z112
Z115
V106 1ST AF & SQUELCH AMPLIFIER VT-289 JAN-12SL7GT
V107- 2ND AF AMP VT-134 (JAN-12A6) OR JAN-12 A6 GT
T101
NOTE 3
R149 1000
R150 1000
C182B 500 MMF
C182A 500 MMF
VARIABLE 30 TO 25 MEG
R167
SQUELCH CONTROL
J103
K105
K106
K107
K108
CLUTCH
DRIVEN MEMBER
DRIVING MEMBER
S101
MOTOR B101
FIELD
E102
K101
K102
K103
K104
CHANNEL A
CHANNEL B
CHANNEL C
CHANNEL D
Y101
Y102
Y103
Y104
(CRYSTAL UNITS DC-31)
O-101A SELECTOR NOTE 4
DYNAMOTOR DY-2/ ARR-2
J5
GENERATOR
MOTOR
J104
L120
L121

R-28/ARC-5 100-156 mc VHF Receiver

ratings. As little as 150 volts will make this receiver perform very well.

Conversion Details

( ) Remove the sides and the top cover and the oscillator compartment covers.

( ) Remove the auto-tune unit and clip the wires leading to it. The front panel will be used to mount the speaker, volume control and squelch control.

( ) Next, let's rewire the filaments for six volts (see figure 1). Remove the wire on pin 2 of V2 and connect it to pin 8 of V2. Ground pin 2 of V2.

( ) Remove the wire on pin 2 of V3 and connect it to pin 7 of V3. Also remove the two 1K, 1 watt resistors connected between pins 2 and 7 of V3. Ground pin 2 of V3.

( ) Remove the wire from pin 7 of V9 and connect to pin 2 of V9. Ground pin 7 of V9.

( ) Remove the two 1K, 1 watt resistors between pins 2 and 7 of V3. Remove the wire on pin 7 of V8 and connect it to pin 2 of V8. Ground pin 7 of V8.

( ) Remove the wire on pin 7 of V7 and connect it to pin 2 of V7. Ground pin 7 of V7.

( ) Remove the wire on pin 7 of V6 and connect it to pin 8 of V6. Ground pin 7 of V8.

This completes the rewiring of the filaments for 6 volt operation.

( ) Remove R143 and C154 and replace them with a 500K pot and a .01 mf capacitor. (See fig. 2.) The volume control should be mounted on the front panel using shield wire.

( ) Remove R145 and replace it with a 470 ohm, 1 watt resistor. R145 is a 1500 ohm resistor connected from pin 8 of V7 (12A6) to ground.

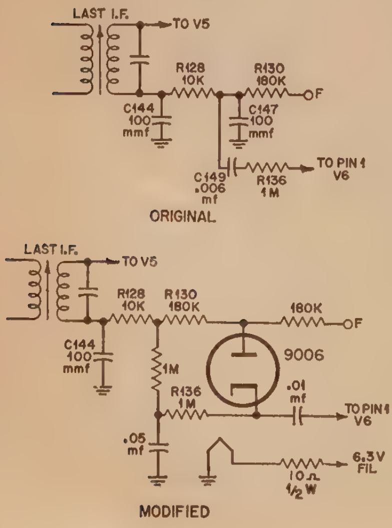


Fig. 3. Noise limiter modifications as described in the text.

( ) Remove the output transformer T101, C157 and R16B. Replace T101 with a midget 5000 ohm plate to voice coil transformer. Connect a .01 mf disc ceramic between pins 3 and 4 of V7.

The incorporation of a noise limiter in the R-28 is well worth the additional trouble because of the increased sensitivity and quietness of operation. The noise limiter will not affect the proper operation of the squelch. Figure 3 shows the method of adding a shunt noise limiter. The tube used in the circuit can be a 9006, ½ of a 6AL5, a diode connected 9002 (grids tied to the plate) etc. Certain crystal diodes may be used but operation will be inferior than that with the tube.

( ) Incorporate the circuit shown in fig. 3.

( ) Locate the two squelch control wires, one comes from pin 6 of V6 and the other from pin 6 of V5. These two wires pass through two small feed-through insulators in the oscillator compartment wall. Extend these two wires to the front panel and connect them to a 50K volume control. One wire should be connected to the "swinger" and the other to an outside lug.

( ) Locate the crystal selector relay for channel A and solder the two contacts together. Insert a crystal of the proper frequency as mentioned before. Because of the odd frequency of the crystals used in the R-28, they are considered "dogs" and can be purchased very reasonably in the surplus stores.

Make the following connections on the rear apron socket.

( ) Connect pins 1, 3, and 4 together.

( ) Connect pin 7 to a source of 150-250 volts dc.

( ) Connect pin 6 to a source of 6 volts ac or dc.

Pin 2 of this socket is the original audio output. Pin 3 may be used to disable the receiver when transmitting simply by opening the connection between it and pin 1. It is connected internally to the i-f cathodes.

( ) Remove the coaxial cable (antenna). Unsolder it carefully from inside the RF compartment and replace it with a piece of RG-58/U about 14" long.

( ) Bring it back through the oscillator compartment and drill ½" holes in the rear of the set and in the wall separating the crystals from the oscillator compartment. Route it carefully so that it will be possible to replace the covers.

( ) Install the speaker on the front panel. Connect the two speaker terminals to the secondary of the output transformer. Mount the squelch and volume controls and replace the front panel on the set.

Now, let's make some initial tests.

( ) First, replace the 12SH7's with 6SH7's, replace the 12SL7's with 6SL7's and replace the 12A6 with a 6K6. Connect the power supply.

( ) Turn the squelch control to the position where the two squelch control wires are shorted. A rushing noise should now be heard.

( ) Rotate the large brass gears connected to the tuning capacitor until an increase in the "rushing noise" is heard. This should occur when the tuning capacitor plates are about ¾ out of mesh. Put a drop of solder on the brass gears at the point where they mesh to lock them in place. This will prevent detuning and simplify alignment.

( ) Connect a weak signal source to the receiver. An "on the air" signal or a Gonset Communicator in the tune up position will work fine. Rotate the squelch control to its critical point (the point where the signal is almost, but not quite, squelched out).

( ) Adjust all of the i-f, r-f, and oscillator tuning screws for maximum signal through the squelch, while keeping it at the critical point. These tuning screws are shown as "A" through "O" in fig. 1. As the alignment progresses, reduce the strength of the signal being used to avoid overloading the receiver. The weaker the signal, the more sensitive the adjustment.

This completes the adjustment of the receiver. It may now be used to receive a single frequency between 144 and 149 mc. If the reader desires to make the receiver tunable over the two meter band, it is possible by inserting a *series tuned circuit* in the crystal holder. This tuned circuit should resonate between 5710 kc and 5890 as the tuning capacitor is rotated through 180°. A circuit for such a tuning system can be found in my Gonset Notes (CQ, Jan.'57). The R-28 can be remotely tuned (when mounted in the automobile trunk, etc.) by constructing a 5.7 to 5.9 mc VFO using any of the standard circuits. The "VFO" would be mounted up front and the 5.7 mc energy pumped back to the trunk via a coax cable.

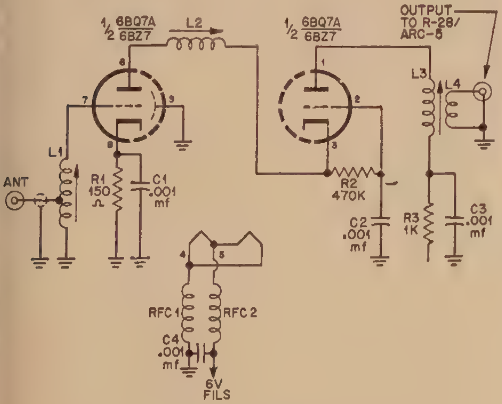
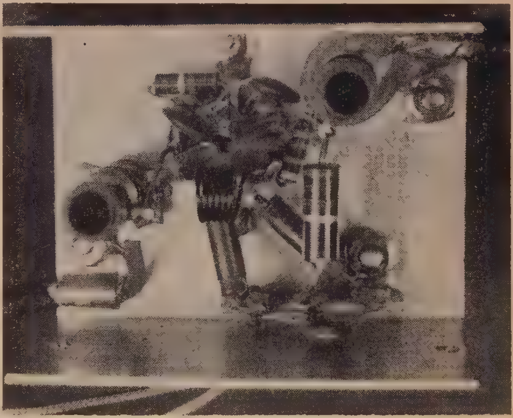
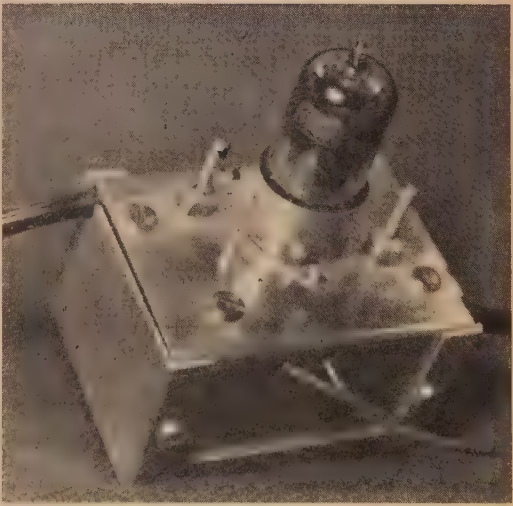


Fig. 4. The cascode preamplifier for the VHF/ ARC-5 receiver.

A Cascode RF Amplifier

It is not recommended that this receiver be used without a cascode r-f amplifier. Its sensitivity without one is about 5 microvolts. With a cascode pre-amp it will be better than two tenths of a microvolt. Commercially built cascodes are available post paid from L. W. Electronics, Route 2, Jackson, Michigan. The price is $12.50 complete with plugs and tube. However, the experienced technician can build

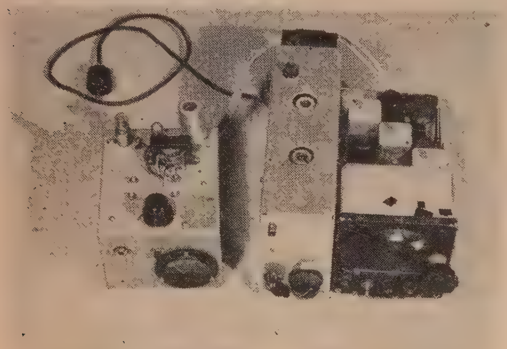




Parts List for the Cascode Preamplifier

C1, C2, C3, C4, C5—.001 mf disc ceramic capacitor
L1—3 turns of #20 wire wound on a ¼" diameter slug tuned form, tapped a 1 turn
L2—6 turns of #20 wire wound on a ¼" diameter slug tuned form
L3—4 turns of #20 wire wound on a ¼" diameter slug tuned form
L4—1 turn of insulated #20 wire wound at the B plus end of L3
R1—150 ohm, ½ watt
R2—470K ohm, ½ watt
R3—1K ohm, ½ watt
RFC1, RFC2—Ohmite Z-144 rf choke
Tube—6BQ7/6BZ7

one in a few hours. Remember, a cascode r-f amplifier will make a 7 watt rig sound like 70 watts on the receiving end. A circuit for a suitable cascode r-f amplifier is shown in fig. 4. The parts placement should allow very short direct connections. Use ceramic or micarta tube sockets, but never bakelite. The tuning response of L1 is very broad and is best adjusted with the aid of a noise generator. If any tendency toward self oscillation develops, spread the turns on 12 slightly. This circuit has a noise figure of about 5 db and a signal gain of 20 db. power for the cascode amplifier can be obtained directly from the dynamotor plug on the rear apron. The amplifier should be constructed on a small L.M.B. chassis box and mounted on the rear deck directly above the dynamotor plug.



The RTTY terminal unit constructed by W9TCJ from the basic design of the Novice "Q"5'er. See letters to the editor for details.

Letters to the Editor

I received a very interesting letter from Philip R. Kennedy, W9AKP, 1410 North Chester Street, Indianapolis 1, Indiana. He writes, in part:

In the March issue of CQ Magazine, in your surplus column, I was reading of the request of K6CSR for information about a unit of the Navy RAL series equipment. I thought you might be interested in this information concerning a piece of equipment which is beginning to turn up on the surplus market. I have instruction books for both the RAK-7 and the RAL-7 units and would be glad to answer any requests for information concerning these equipments, should you want to pass that word along. *Many thanks, Philip, I'm sure this information will be of help to the readers that have the RAL and RAK receivers.*

Dear Don: I have recently acquired an ID-60/APA-10, panadapter and oscilloscope. The problem is that the power transformer is made for 115 volt, 400 cycle operation. Also, I have no idea what various functions it might be designed to perform. Could you tell me where I might be able to obtain an original manual of instruction for this monstrosity or a circuit diagram or both? Sincerely, Lewis J. Bedsoe, W4MHA, 6110 Easton Rd., Knoxville, Tenn. *Lewis, there is an exact replacement transformer available for the APA-10 panadapter, from Ferranti Transformer Company in New York. The transformer is handmade and costs about $25.00 but it is well worth it when you consider what you have when finished. Several companies advertise APA-10 manuals, check the classified's in CQ.*

Robert H. Weitbrecht, Yerkes Observator William Bay, Wisconsin sends some inform tion on an RTTY receiving unit built arour the Novice "Q"5'er (A converted BC-453 W9TCJ will have an article on Auto Start in future issue of RTTY magazine if you woul like more information. Bob says:

I am extremely pleased with the receiver as it stanc as regards frequency holding i.e. stability. It is on hour monitoring basis in an automatic start (unattended radioteletypewriter system, and I find that the receiv will and does hold to within 20 to 40 cycles of the se up channel frequency for weeks on end. As a matter fact, I have not had to readjust the receiver tunir more than once every month! *Well, I knew it w stable, but that is better than my expectations, Bob.*

Waldo Longwell, 518 Euclid Avenue, Elmir N. Y. would like to obtain information on th RAL-5 receiver. *See the letter above fron W9AKP, Waldo.*

R. D. Buit Jr., KN4SFE, 1918 George St Aiken, S. C. would like to obtain a manual o the BC-348/Q.

Another man with a problem is John T Laney, K4BAI, 3500 14th Avenue, Columbu Georgia. His problem goes something lik this:

Dear Don, I am in very bad need of a 500 watt larger modulation transformer for my transmitter. Th one I burned out is a UTC #PA8507, but I believe could use about any surplus kind available. I am using pair of 100TH's in the final and a pair of 5514 modul tor with a 2,000 volt power supply. *I hope one of t readers can come up with a replacement for you, Joh*

Here's another one of *those* requests.

Dear Don:

I would like to convert my TBY if it is worth t effort. And how is the SCR-522 after conversion to S meters? Sincerely Louis Pisha Jr., W2LNJ, 4318 Wild Avenue, Bronxville, N.Y. *I'm giving serious thought that TBY conversion Louis. The transmitter portion of t SCR-522 makes a fine Six meter transmitter by replaci the tripler (832) plate coil to six and returning t driver stages.*

By George, two in a row!

Dear Don:

I would like to see a conversion on the TBY transcei as soon as possible. Also, any information on the MBF 110 volt ac & dc transceiver for 6 meters would be interest to 50 mc enthusiasts. Yours truly, Tom Hage man r., W0TEF, 10498 Toelle Lane, St. Louis, 15, M *Looks like I am being mobbed with requests for a T conversion. The MBF is a real hot project right now a a conversion is planned for an early fall issue.*

Maybe good things come in pairs. W7R writes:

Dear Don, How about a conversion on the Collins M transceiver. Columbia Electronics of L.A. is selling th now at $22.95 and that's a real value. I know, beca I've had one for 4 years and it has been a real convers piece. Sincerely, Mr. L. Whipple, 6327 21st N.E. Sea 15, Washington. *That cinches it, one MBF convers coming up, with a TBY in the side pocket.*

That seems to empty the folder marked Surp Column, for this month. Future articles pr ently in the lab stage include the Navy TBX 80 and 40 meter phone-cw transceiver, t Collins MBF conversion to Six and Ten mete and last but not least the TBY to Six and T meters.

73, Don, W6T

TOP FOR EACH BAND

Single Operator

28 mc	JA1CO	64,875
27 mc	W8AJW	1,025
21 mc	W8BKP	110,212
14 mc	W4VZQ	143,850
7 mc	W3BVN	50,888
3.5 mc	DL1FF	10,234

TOP TEN

All Band Single Operator

4X4BX	752,346	W3ECR	517,567
W4KVX	654,088	CE3AG	508,396
K2GL	628,290	CE5JK	482,788
W3GRF	588,200	W8JIN	469,319
KH6IJ	560,952	YU3BC	444,528

TOP FIVE

Multi Operator

W6DFY—561,660 KH6CBP—448,762
W6UED—499,235 W6NJU—395,063
W3VKD — 373,449

Frank Anzalone, W1WY
4 Sherwood Road
Stamford, Conn.

DX Contest Results—CW

They did it again. — It was not enough that 4X4DK took top honors in the Phone Contest but now 4X4BX, Sam Monastirsky completed the job in the CW Section. His record breaking score of 752,346 points was achieved by having next to the highest number of contacts, 888 and the largest country multiplier, 294 on all bands. Congratulations Sam, you are the winner of the W2IOP trophy, donated by Larry LeKashman to the single operator having the highest All Band cw score.

A surprise second was W4KVX, Don Chester whose 135 zones was the largest zone multiplier. He was closely followed by K2GL operated by John Ryan, W7KVU, who by a stange coincidence was on the East Coast during the CW week end. W3GRF, Leonard Chertok last year's operator at W2HJR, decided to stay home and operate his own rig and took the fourth spot. And who had the most QSO's? You guessed it, Nosey of KH6IJ came with 1,183 contacts. This enabled him to place fifth. Next was W3ECR operated by Russel Martin, W3MFW. And in seventh position was CE3AG, Luis Desmaras. This completed the better than half a million point group.

The Single Band operators all came thru with record breaking scores with the exception of 14 mc. This record is still held by W4KFC. Vic's 171,776 points last year is still the record to beat. It was to be expected that 28 mc and 21 mc would show considerable gains over last year but we were surprised to find JA1CO at the top of the 10 meter heap and that W8BKP had nosed out W2WZ, last year's champ on 15. The 14 mc gang was pretty well bunched and many showed scores in excess of 100,000 with 38 zones and 99 countries but only W1HZ hit the century mark in countries. To our knowledge this is only the second time it has been done by a single operator on one band. Last year W3JTK also on 20 worked 102 countries. In number of contacts KL7PIV led the one banders with 538 contacts on 21 mc.

The 27 mc band only received limited use and that by the All Banders as a means to increase their multiplier, but W8AJW stuck it out long enough to win himself a certificate on a Single Band.

On the lower frequency bands special mention must be made of W3BVN and his record breaking performance on 40. His 50,388 points and 241 QSO's in 51 countries is going to be a hard record to beat. Lyle's remark, "too little, too late, wait until next year," must go down as the understatement of the contest.

The 80 meter band was dominated by the EU boys and Armin, DL1FF topped them all with 10,234 points and 187 QSO's in 35 countries.

The 160 meter band just didn't exist except for an occasional local contact for a 1 and 1 multiplier.

The Multi Operator competition was dominated by the Southern California gang in the USA and it was their totals in this section that enabled them to beat out the Potomac Valley group for the CQ Magazine Plaque. This is a new prize donated to the DX club showing the highest totals in both the Phone and CW contests. Congratulations fellows, but don't let it go to your heads. We have a feeling the East Coast gang will be out gunning for you next year. Many of the foreign stations claimed club participation and their totals are herein listed but they cannot be honored for club award. The rules distinctly stated that it has to be an affiliated DX club not a national organization.

The score turned in by W6MUR on 14 mc was not the highest but Rod Johnson and Bill

CW SECTION SINGLE OPERATOR

Letter designates power used, A-up to 35 watts; B-up to 150 watts; C-up to 500 watts and D-500 watts and over. Winners are underlined.

NORTH AMERICA

Call	Band	Pts	QSOs	Zns	CC	
United States						
W1BIH	All	320,320	417	94	186	D
W1ODW	"	147,764	262	78	134	D
W1JYH	"	89,910	185	65	120	D
W1ZD	"	22,977	83	46	65	D
W1PWK	"	11,760	63	26	44	B
W1WY	"	3,948	40	22	25	A
W1BCD	28	7,348	61	16	28	B
W1PLJ	"	200	11	4	4	B
W1CTW	21	20,658	113	24	42	D
W1DDO	"	2,240	24	11	21	B
W1HZ	14	86,858	229	37	100	D
W1QJR	"	57,873	212	31	70	D
W1NLM	"	1,215	27	14	13	-
W1NI	"	273	7	6	7	-
W1APA	7	4,068	49	14	22	C
K2GL	All	628,290	630	118	240	D
W2AGW	"	304,395	400	89	184	D
W2PTI	"	82,999	191	65	102	C
W2RUJ	"	58,520	148	64	88	B
W2QJM	"	18,584	78	46	55	C
K2OPJ	"	4,644	51	18	25	B
W2LRJ	"	624	14	12	12	C
K2KNV	"	621	13	12	11	-
W2EQS	28	3,708	45	16	20	C
K2GVN	"	1,742	24	11	15	C
W2WZ	21	105,768	395	31	73	D
K2PIC	"	36,176	170	24	52	D
W2CVS	"	29,040	130	22	58	D
K2CF	"	21,546	90	26	55	B
W2CJT	"	19,856	110	23	45	B
W2GJD	"	14,190	78	25	41	C
W2AIW	14	126,080	347	36	92	D
W2UFT	"	110,148	289	37	97	D
W2HMJ	"	74,883	246	33	76	D
K2GMO	"	61,490	200	32	78	D
W2ABM	"	39,006	148	31	68	D
K2BSM	"	28,203	131	26	53	D
W2JT	"	11,529	61	28	35	D
W2QKJ	"	8,778	59	19	38	C
K2KID	"	5,566	[illegible]	17	29	D
W2JB	"	3,384	40	12	24	A
W2CJM	"	3,034	30	16	21	C
K2LWR	"	1,755	29	11	16	B
W2BYN	"	1,392	18	13	16	D
W2ZXL	"	1,188	18	11	16	C
K2KXZ	"	1,008	25	9	12	B
K2ONP	"	322	13	7	7	C
K2OEG	"	4	[illegible]	1	1	A
K2QZR	7	570	14	8	11	B
W3GRF	All	588,200	623	111	229	D
W3ECR	"	517,567	530	118	231	D
W3JTK	"	431,424	456	109	227	D
W3EIV	"	335,120	425	93	191	D
W3MVQ	"	181,662	299	85	136	D
W3KDP	"	98,753	228	54	103	D
W3ADZ	"	75,348	197	47	91	D
W3ZQ	"	56,950	156	49	85	D
W3MSR	"	55,580	155	59	81	B
W3DBX	"	49,980	127	54	93	B
W3KLA	"	27,510	104	42	63	B
W3ZA	"	11,097	52	38	43	B
W3MFJ	21	63,705	235	29	64	C
W3AYS	"	50,776	207	29	59	D
W3AMA	"	41,448	171	27	61	B
W3HVM	"	17,181	92	24	45	B
W3VTH	"	3,780	33	15	27	B
W3MDO	14	10,488	54	22	47	C
W3CXQ	"	4,140	45	18	27	C
W3WU	"	2,680	31	18	22	C
W3BVN	7	50,388	241	25	51	D
W4KVX	All	654,088	607	135	253	D
W4YHD	"	333,644	461	89	173	D
W4KXV	"	257,292	372	91	161	D
W4PNK	"	95,142	222	58	99	C
W4GXB	"	82,698	179	56	98	D
W4JAT	"	19,992	91	33	51	D
K4DTI	"	10,500	73	31	39	B
W4WSF	"	3,731	44	20	21	B
W4ZH	"	2,944	35	19	27	D
W4OMW	"	2,665	32	18	23	-
W4KMX	"	1,250	18	12	13	-
W4FNR	"	1,248	19	16	16	B
K4CTU	28	35,497	167	25	52	C
K4HNA	"	16,348	89	23	44	C
W4EEO	"	18	[illegible]	1	1	-
W4LZF	21	51,608	197	28	64	D
K4GOZ	"	4,085	36	19	24	B
K4CFB	"	2,046	[illegible]	14	17	B
W4IEH	"	1,482	27	18	21	D
K4HAV	"	1,218	21	15	21	B
W4VZQ	14	143,850	371	38	99	D
W4NBV	"	11,440	81	25	30	D
W4JBQ	"	7,904	57	21	31	D
W4OM	"	5,967	41	22	29	D
K4DRO	"	288	22	6	10	B
W4ZQK	"	182	10	6	8	B
W5ZD	All	107,042	227	76	103	D
W5KC	"	24,794	104	42	56	B
W5DXW	"	18,525	[illegible]	49	46	C
K5DGI	"	10,241	52	37	40	C
W5ZWR	"	2,555	25	16	19	B
W5BVX	27	304	22	8	8	C
W5KJN/5	21	11,940	77	25	35	B
W5QF	"	9,152	70	25	27	B
W5MY	"	6,968	51	23	29	C
W5VLF	"	705	19	7	8	A
W5GIE	"	640	14	10	10	B
W5DGV	14	42,120	160	34	70	D
W5BZT	"	28,530	118	32	58	-
W5LFK	"	7,991	52	25	36	D
W5IAH	14	7,497	51	26	37	B
W5PM	"	2,410	23	16	20	B
W5EQT	7	5,016	61	16	22	C
W5FWA	"	756	20	10	8	C
W6ITA	All	333,184	444	106	168	D
W6BPD	"	241,920	361	99	157	D
W6VUP	"	214,650	310	110	160	D
W6BYH	"	63,536	160	62	90	D
W6GWQ	"	52,542	156	67	72	D
W6JDO	"	49,140	176	49	50	D
W6FLT	"	21,356	99	34	42	D
K6IYJ	"	11,781	79	31	32	C
K6IBE	"	10,917	77	29	28	C
W6RAN	"	6,972	42	27	32	D
K6LSG	"	6,480	73	21	19	A
K6KII	"	4,280	33	20	[illegible]	B
K6HFA	"	4,056	43	20	19	C
W6MJP	"	2,325	34	15	16	C
K6HXX	"	570	23	8	7	B
W6OYD	28	5,670	48	21	24	D
K6ANP	"	3,968	46	16	16	B
K6KUQ	"	3,456	42	16	[illegible]	B
K6UYW	"	1,408	26	11	11	D
W6NZW	21	32,370	154	26	52	B
W6EFR	"	24,124	121	27	47	D
W6KSM	"	20,300	104	27	43	D
K6DDO	"	18,090	122	23	31	-
W6AFI	"	17,523	113	23	36	B
W6TCQ	"	13,144	90	25	28	B
W6MUF	"	7,248	58	21	27	-
W6OXS	"	5,400	60	17	19	A
W6MCY	"	4,216	50	16	18	B
K6EWL	14	132,205	352	38	[illegible]	D
W6TSW	"	125,840	351	34	96	D
W6TZD	"	94,605	286	33	86	D
K6EIV	"	56,210	190	35	75	C
W6ALQ	"	49,276	186	32	65	D
W6FWO/6	"	42,292	142	37	72	D
W6NNV	"	34,668	120	35	72	D
K6CEF	"	28,917	119	31	50	C
W6TMX	"	24,016	128	29	47	D
W6YY	"	17,680	96	29	39	D
W6BIL	"	11,360	58	27	44	D
W6OKK	"	6,762	61	22	27	D
K6ICS	"	1,218	34	10	11	B
K6HTM	"	1,075	21	13	12	C
W6IBD	7	17,262	106	25	[illegible]	D
W7SFA	All	159,936	297	79	117	D
W7PQE	"	130,995	254	88	117	D
W7GHB	"	18,810	84	38	52	C
W7ENA	"	5,060	42	28	27	B
W7MQY	28	8,350	64	23	27	B
W7AOZ	21	24,004	132	25	43	B
W7AHX	"	11,271	83	20	31	C
W7DAA	"	5,940	52	19	25	D
W6KNE/7	"	1,240	26	10	10	B
W7VY	14	126,752	300	37	99	D
W7GBW	"	65,780	205	38	77	D
W7GXA	"	38,752	127	37	75	-
W7AC	"	20,244	91	31	53	C
W7QON	"	15,194	83	25	46	D
W7DJY	"	9,338	57	23	35	D
W7AMX	"	9,114	54	25	37	D
W7NKW	"	5,781	50	18	23	D
W7VRO	"	924	27	12	10	-
W7JLU	7	4,386	54	14	20	D
W7BSP	"	200	9	5	5	B
W8JIN	All	469,319	544	113	210	D
W8OCT	"	236,520	334	91	179	D
W8RQ	"	150,866	243	94	147	C
W8UPN	"	147,680	257	71	137	D
W8OCK	"	126,973	251	70	117	D
W8EV	"	119,915	238	67	116	D
W8TUO	"	77,656	208	51	85	D
W8UMR	"	52,514	138	49	72	B
W8QXW	"	6,104	50	29	27	C
W8IBX	"	2,142	39	17	17	B
W8Bp	28	4,218	37	13	25	-
W8JAQ	"	1,444	26	7	12	B
W8AJW	27	1,025	22	13	12	B
W8BKP	21	110,212	330	36	82	D
W8QID	"	27,255	130	26	53	C
W8CQ	"	23,146	119	24	47	C
W8KC	"	13,986	81	24	39	C
W8UKI	"	6,578	63	19	27	B
W8PCS	"	2,030	23	15	20	C
W8EEZ	"	1,175	30	13	12	A
W8NBK	14	115,354	304	38	99	D
W8BRA	"	66,912	180	37	99	D
W8BTI	"	54,405	168	35	82	D
W8MQR	"	15,120	87	26	44	D
W8KPL	"	12,870	67	31	47	C
W8UMP	"	2,380	37	16	18	A
W8MQA	"	1,820	27	11	15	C
W8BDO	"	168	13	6	6	A
W8FGX	7	33,336	161	24	48	D
W8WZ	"	16,870	94	25	45	D
W9HUZ	All	210,588	296	105	171	D
W9FJY	"	198,832	280	105	167	D
W9ABA	"	62,832	201	35	75	-
W9VZP	"	7,350	53	20	30	B
W9FDX	"	6,528	45	26	38	-
W9CR	"	6,228	28	19	20	B
W9FYM	"	756	14	10	11	-
W9HCX	"	464	13	6	8	B
K9EWB	"	30	9	5	5	B
W9MUJ	28	11,300	94	19	31	B
W9OAN	"	3,293	40	17	20	C
W9QM	"	2,415	30	15	20	D
W9IRH	21	16,104	108	21	40	D
W9OZX	"	11,820	76	22	38	C
W9ZTD	"	9,650	71	20	30	D
W9LJR	"	4,872	44	16	26	C
W9CNF	"	4,428	50	18	23	B
W9GIH	"	266	7	7	7	B
K9CLO	14	51,064	191	36	68	D
W9IU	"	46,269	177	32	65	B
W9VIN	"	41,250	138	36	74	D
W9PCF	"	9,676	60	22	37	C
W9ROU	"	9,548	56	23	39	D
W9FDL	"	5,040	44	22	26	C
W9OTS	"	3,145	31	15	22	D
W9PNE	3.5	882	29	10	11	C
W0DAE	All	100,547	201	83	118	D
W0YCR	"	63,384	189	59	80	D
W0QDF	All	29,737	94	37	44	D
W0GUV	"	15,120	76	40	40	D
K0BSL	"	1,749	30	16	17	C
W0BMM/0	"	540	10	10	10	D
W0ANF	21	6,816	56	23	29	D
W0DU	14	24,424	103	32	54	C
W0ZKE	"	14,280	86	26	44	B
W0RAP	"	7,280	67	24	32	C
W0PGI	"	4,644	54	16	20	C
W0GAX	"	1,058	22	11	12	B
W0JMB	"	1,025	16	13	[illegible]	-
K0ARS	"	640	34	9	11	A
Alaska						
KL7BBY	All	60,628	404	37	55	C
KL7RZ	"	60,297	395	40	61	C
KL7BVE	"	30,208	428	25	34	B
KL7PIV	21	60,599	538	28	49	D
KL7BUZ	14	20,185	178	18	37	C
KL7GI	"	8,136	164	15	21	-
KL7UM	"	6,439	59	18	29	D
Bermuda						
VP9CY	14	44,748	499	23	43	B
Canada						
VW2ZVC	All	840	29	10	11	B
VE2AJD	"	299	17	8	5	B
VE3EU	"	22,368	119	41	55	B
VE3ADV	"	578	12	8	9	-
VE5PM	"	11,534	75	33	40	C
VE7ZM	"	50,840	241	56	68	B
VE7EH	"	29,400	267	45	39	C
VE8OW	"	63,156	315	43	71	B
VE8AB	"	15,387	160	34	35	B
VO6N	"	11,546	231	21	25	C
VO2S	"	4,680	76	17	22	A
VE2APH	28	2,520	34	12	16	B
VE2AKF	21	374	26	6	5	B
VE3AIU	"	31,027	230	23	48	D
VE3AAZ	"	20,405	99	26	51	C
VE3DT	"	6,815	68	19	28	C
VE6VK	"	27,776	266	25	37	B
VE1EK	14	3,658	69	10	21	A
VE2AEW	"	9	3	2	1	C
VE3BMB	"	4,902	67	17	21	B
VE3HB	"	4,664	58	18	26	C
VE3YV	"	3,655	29	21	22	B
VE3ASR	"	1,207	37	8	9	C
VE3DNE	"	936	77	6	6	B
VE5DZ	"	460	11	9	11	C
VE6NX	"	32,123	118	31	60	C
W2RX/VO2	"	8,040	129	16	26	D
VE2ATT	7	24	8	2	1	B
VE3IR	3.5	306	34	5	4	B
Canal Zone						
KZ5KA	21	4,800	166	11	14	B
KZ5BC	14	7,028	230	12	16	-
Costa Rica						
TI2AB	14	14,101	133	21	38	D
Cuba						
CO8DL	14	22,168	194	24	44	B
CO2HB	"	495	45	7	4	B
CO7PG	"	172	43	3	1	B
Honduras						
HR1AT	14	7,950	82	17	36	-
Mexico						
XE1H	All	7,950	100	16	12	-
XE1PJ	21	640	18	11	9	C
XE1KD	7	259	33	4	3	-
Puerto Rico						
KP4JE	All	189,344	519	71	123	C
St. Pierre Is.						
FP8AP	All	1,300	130	6	4	-
AFRICA						
Amsterdam Is						
FB8ZZ	14	23,100	181	20	24	-
Angola						
CR6AI	All	298,344	566	61	125	C
CR6CS	21	9,362	106	13	18	B
CR6DA	28	12,314	102	18	29	B
Belgian Congo						
OQ5CP	All	153,028	393	46	88	A
Canary Is.						
EA8BF	all	152,889	458	41	72	A
EA8BK	14	6,950	94	8	17	A
Ethiopia						
ET2RH	14	81,606	323	27	60	B
Kenya						
VQ4DT	All	317,490	581	64	126	B
VQ4KPB	"	28,536	125	36	51	A
VQ4GF	28	38,624	199	23	45	B
VQ4RF	21	67,837	304	23	54	B
Liberia						
EL2L	14	9,240	148	11	10	C
Madagascar						
FB8BD	14	6,624	66	17	29	A
Mauritius						
VQ8AB	14	7,704	79	16	20	A
Mozambique						
CR7BS	All	67,914	307	33	44	B
CR7AF	"	43,400	243	24	38	B
CR7CO	"	2,142	43	10	8	B
CR7CI	14	610	23	6	4	A
Nyasaland						
ZD6BX	All	42,964	178	41	51	-
Rhodesia, No.						
VQ2GW	All	87,084	259	47	71	B
Rhodesia, So.						
ZE3JP	All	271,092	579	66	98	B
ZE3JO	"	25,795	136	29	38	A
South Africa						
ZS2HI	All	292,689	659	62	91	B
ZS5U	"	148,480	444	52	64	B
ZS2U	"	2,886	45	13	13	B
ZS5RB	"	704	19	7	7	-
ZS6AJQ	14	19,967	166	19	22	B
ZS1FS	"	2,232	63	7	5	-
Sudan						
ST2JC	All	61,256	207	32	72	B
Tunisia						
3V8BI	14	2,592	32	10	17	A
Afghanistan						
YA1AM	14	9,953	95	16	21	-
Burma						
XZ2OM	All	27,864	140	37	44	B
Ceylon						
4S7WP	14	47,432	218	27	5	
4S7MR	"	29,946	169	22	4	
Cyprus						
ZC4AA	All	28,487	159	17	4	
Hong Kong						
VS6AE	All	145,760	332	61	9	
VS6DE	"	32,552	131	49	5	
India						
VU2EJ	All	28,980	86	36	5	
VU2HF	21	29,120	138	28	5	
Israel						
4X4BX	All	752,346	888	84	29	
4X4CK	"	406,944	656	63	15	
4X4FS	"	278,016	486	51	14	
4X4DR	"	230,112	502	36	10	
Japan						
JA1VX	All	197,708	425	62	9	
JA1CJ	"	177,096	341	78	11	
JA6AK	"	157,275	410	54	8	
JA5AI	"	88,440	264	48	7	
JA7AD	"	62,244	279	33	4	
JA3BB	"	55,554	209	48	4	
JA7BO	"	29,632	161	32	3	
JA9BE	"	17,220	86	38	4	
JA1CR	"	16,146	90	33	3	
JA5DF	"	11,766	76	29	2	
JA1AB	"	6,660	72	17	1	
JA1BFJ	"	4,816	41	20	2	
JA1AFF	"	2,340	35	13	1	
JA5AF	"	1,584	24	12	12	
JA1CO	28	64,875	304	28	[illegible]	
JA3AB	"	52,585	276	25	40	
JA1EC	"	12,397	95	21	28	
JA2BL	"	6,392	66	17	17	
JA1OP	"	1,672	32	9	10	
JA1QI	21	40,687	230	25	36	
JA3BN	"	39,804	221	26	36	
JA8AQ	"	24,090	152	23	32	
JA8AA	14	52,020	275	27	41	
JA6AD	"	41,420	201	29	47	
JA1AA	"	31,536	159	28	44	
JA9AA	"	22,960	121	26	44	
JA1DO	"	14,740	96	23	32	
JA1AS	"	10,906	86	17	21	
JA0AA	"	1,728	37	10	8	
JA3AZ	"	1,512	24	14	14	
JA5AB	7	3,168	52	11	11	
JA1BC	"	285	20	2		
JA3SW	"	90	14	1	1	
KA5ZS	14	1,976	37	13	1	
Lebanon						
OD5LX	All	156,705	353	48	10	
Malaya						
VS2EF	14	13,338	117	20	1	
Pakistan						
AP2RH	All	38,541	159	30	5	
Singapore						
VS1GX	All	4,089	47	13	1	
U.S.S.R., Asiatic						
UA9CC	All	99,360	288	33	8	
EUROPE						
Austria						
OE5JK	All	482,788	754	85	18	
OE1LM	"	43,287	180	41	10	
OE3VP	"	41,561	167	44	9	
OE6RP	"	36,608	189	31	9	
OE5SD	"	33,117	234	20	6	
OE3SL	"	8,468	71	30	4	
OE5BW	14	22,608	177	21	5	
OE5WW	"	8,968	97	19	4	
OE8SH	"	5,969	55	18	2	
OE3RK	"	14,300	224	11	3	
Azores						
CT2BO	All	6,120	80	12	2	
Belgium						
ON4HB	All	205,779	420	70	16	
ON4AU	"	109,980	242	75	1	
ON4CK	"	64,240	213	45	10	
ON4DO	"	1,696	43	8	2	
ON4WS	"	1,075	46	5	2	
ON4HY	"	759	57	4	1	
ON4AL	21	13,570	88	15	3	
ON4SH	7	1,856	59	5	2	
Bulgaria						
LZ1WD	All	85,491	284	52	10	
LZ1KRB	"	1,344	39	9	2	
Czechoslovakia						
OK3DG	All	335,646	709	83	17	
OK1FF	"	297,480	517	81	18	
OK2KBR	"	236,178	661	67	16	
OK1NC	"	164,348	447	75	15	
OK1XQ	"	78,660	201	62	10	
OK1AEH	"	55,936	256	44	10	
OK1KCB	"	21,408	182	25	7	
OK1CX	"	15,662	93	31	5	
OK1EB	"	9,975	101	20	5	
OK2KYK	"	3,784	78	11	3	
OK1KOB	"	2,940	68	10	3	
OK1KTV	"	2,679	58	18	2	
OK1NS	"	1,628	24	15	2	
OK2KAU	"	1,566	60	8	2	
OK1AW	28	191	8	4		
OK3SP	21	23,488	187	21	4	
OK1JX	"	6,572	61	17	3	
OK2GY	14	1,711	50	8	2	
OK2JL	7	1,846	68	5	2	
OK3EE	3.5	2,560	80	4	2	
OK1AC	"	1,430	65	4	1	
OK1KBK	"	920	48	4	1	
OK1FV	"	336	26	4	1	
Denmark						
OZ7BG	All	188,320	415	66	14	
OZ4IM	"	16,720	185	15	6	
OZ4PM	"	10,440	117	20	5	
OZ5K	"	1,995	34	14	2	
OZ7AX	"	576	6	6		
OZ7SN	21	9,494	93	16	3	
OZ7KP	14	3,737	101	9	2	
OZ6HS	7	1,659	80	4	1	
OZ2NU	3.5	4,185	135	4	2	
OZ4AH	"	352	22	4	1	

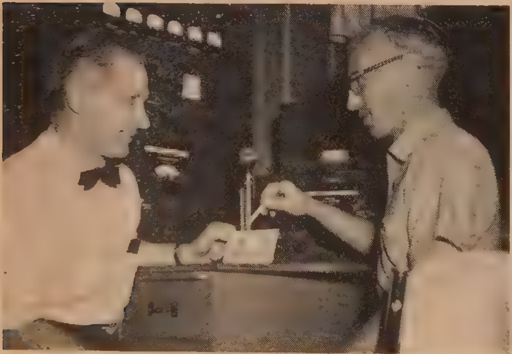
l	Band	Pts	QSOs	Zns	CC	
Eire						
J	All	95,192	328	44	102	B
England						
PQ	All	300,094	526	72	155	B
P	"	209,032	430	72	160	B
C	"	182,432	397	68	140	B
XB	"	140,980	338	59	131	B
PF	"	90,903	308	47	110	B
YN	"	87,368	239	54	109	B
JB	"	66,303	245	52	107	B
ML	"	63,940	197	39	76	B
AY	"	34,077	214	31	80	B
N	"	30,750	137	41	82	B
SF	"	16,275	153	19	74	B
UP	"	7,303	55	27	40	-
IW	"	5,376	70	18	38	B
VJ	"	2,160	34	17	23	-
Q	"	1,870	37	10	12	B
Z	28	4,500	130	18	27	B
P	"	304	9	7	9	-
OG	"	30,525	195	24	51	B
B	"	92,232	427	33	75	B
U	"	12,036	210	11	40	B
UL	"	5,544	134	6	30	A
P	3.5	2,574	63	7	26	-
Faroes Is.						
ML	All	2,565	35	16	29	-
Finland						
RA	All	107,920	325	59	131	B
XK	"	73,428	236	50	124	B
NT	"	62,400	221	50	110	B
OD	"	45,095	226	46	99	B
HK	"	39,808	154	39	89	A
YV	"	39,150	215	34	111	B
OU	"	35,910	182	36	90	B
UN	"	16,050	106	33	74	-
QL	"	14,160	107	22	58	A
OU	"	12,090	103	23	55	-
RC	"	5,478	55	19	47	B
TG	"	4,118	52	20	38	B
II	"	2,508	29	16	28	A
QC	"	2,132	39	13	28	B
KA	"	1,920	57	8	24	B
IK	"	1,748	44	9	29	B
LP	"	1,392	49	5	24	-
UI	"	280	8	7	7	A
KQ	28	6,615	53	17	32	B
NJ	21	7,906	65	17	42	B
OT	"	7,824	114	13	35	B
PP	"	7,280	96	12	28	B
SM	"	4,464	83	10	26	B
RD	"	3,230	45	11	27	A
XX	14	30,495	161	26	69	B
TI	"	19,422	170	23	55	-
PF	"	11,376	130	13	35	B
QZ	"	11,285	91	20	41	B
KH	"	7,176	106	16	37	A
NW	"	7,172	94	14	30	B
IQ	"	4,048	63	9	35	B
OB	"	3,900	58	13	26	B
VZ	"	3,080	43	15	29	B
PJ	"	2,059	39	10	19	B
ST	"	1,925	34	12	23	B
TT	"	800	24	8	17	A
PG	"	779	39	4	15	A
JF	"	575	25	5	18	B
NF	7	8,170	154	12	31	C
RU	"	1,600	64	4	21	A
ZR	"	800	38	5	15	A
RE/2	"	736	31	5	18	B
LU	3.5	1,625	66	4	21	A
France						
Y	All	92,434	391	30	83	B
M	"	45,630	218	32	103	B
E	"	15,652	91	35	56	B
S	"	4,403	52	14	23	B
W	"	3,243	33	21	26	B
Q	"	3,159	46	15	24	B
F	"	1,110	29	10	20	B
Q	"	600	21	7	17	B
	"	323	9	8	9	A
B	28	13,080	89	20	40	B
Z	21	9,916	105	10	27	B
S	14	66,030	345	29	64	B
J	"	2,592	53	6	21	A
Germany						
PZ	All	217,210	429	72	142	B
AA	"	190,115	340	83	152	C
BA	"	171,288	293	84	160	C
LU	"	101,322	247	67	129	C
AU	"	97,856	324	57	82	B
YO	"	42,864	159	51	90	B
FN	"	33,672	144	43	95	B
GN	"	27,060	157	34	89	B
ZI	"	26,136	130	42	79	B
SO	"	24,000	112	39	61	B
YA	"	21,670	105	39	71	B
XF	"	20,979	100	36	75	B
2ABE	"	9,291	182	13	44	B
FA	"	5,936	61	21	35	B
AE	"	2,632	48	11	36	B
DX	28	48,535	208	29	56	-
QT	"	15,360	97	22	42	B
BO	"	11,165	82	23	32	B
DF	"	7,134	65	17	24	B
JW	21	61,272	263	27	63	B
PJ	"	3,108	50	11	10	C
MN	"	2,744	46	11	17	A
FE	14	75,900	337	31	79	B
3KCH	"	10,020	92	16	44	B
YA	7	14,832	257	11	37	B
PJ	"	8,692	191	7	34	B
FF	3.5	10,234	187	8	35	B
KR	"	1,566	[illegible]	4	23	A
III	14	68,460	305	29	76	D
Greece						
WT	All	227,664	414	78	170	B
Iceland						
3AB	All	53,720	292	26	59	B
3SG	"	13,332	119	22	44	B
3KA	14	29,700	272	13	32	B
3NA	"	816	24	8	16	B
Italy						
I1NT	All	153,330	372	55	135	C
I1CHJ	"	111,312	362	48	96	-
I1ER	"	233	24	8	7	B
Netherlands						
PAØLZ	All	172,575	459	58	137	B
PAØVB	"	157,611	385	62	131	B
PAØEP	"	73,980	234	68	69	B
PAØNV	"	13,398	128	18	40	-
PAØHP	"	7,040	53	16	39	B
PAØSNG	"	6,710	113	11	50	-
PAØHBO	"	5,115	93	12	43	-
PAØWTJ	"	3,680	73	11	35	B
PAØZV	28	3,256	35	17	20	A
PAØVO	21	18,216	130	20	46	B
PAØKX	"	17,612	102	24	50	-
PAØQT	"	16,302	113	21	45	B
PAØNW	"	1,947	29	10	23	B
PAØULA	14	34,276	203	26	56	B
PAØZL	"	18,546	160	23	45	B
PAØLOU	"	11,648	125	15	41	B
PAØIP	"	9,018	91	17	37	B
PAØWAC	"	4,068	50	17	37	B
PAØPLM	"	962	32	8	18	A
PAØNIC	7	6,048	102	11	31	B
PAØTON	"	893	51	3	16	-
PAØWTM	"	425	25	3	14	-
PAØCOR	"	247	19	4	9	-
PAØINE	3.5	4,371	141	5	26	-
PAØTA	"	4,080	118	5	29	-
PAØLV	"	3,780	132	4	26	-
Norway						
LA6U	All	29,784	128	35	101	A
LA7X	"	21,762	138	30	63	B
LA2Q	"	19,080	165	24	66	-
LA4K	"	7,560	59	29	43	-
LA2VC	"	6,630	67	19	46	-
LA2MA	"	2,993	41	9	32	-
LA7KA	"	330	10	6	4	-
LA6FA	28	759	15	10	13	B
LA7Z	14	11,280	116	19	41	-
LA5HE	"	800	31	6	19	-
Poland						
SP3PL	All	61,699	262	47	112	A
SP3AK	"	14,110	106	30	55	B
SP8CK	28	17,127	123	20	37	C
SP3PK	"	14,592	100	23	41	B
SP6GB	"	3,900	45	16	23	A
SP8AG	14	14,418	201	14	40	A
SP4KAI	"	13,000	175	17	35	C
SP6BY	"	6,165	85	14	31	A
SP8KAF	"	5,330	90	13	28	B
SP8EV	"	5,280	88	13	31	A
SP9EU	"	5,070	110	11	28	A
SP2GS	"	1,820	57	6	22	-
SP3CU	7	9,430	223	7	34	A
SP6BZ	"	2,492	91	4	28	-
SP9DT	"	1,675	70	4	21	A
SP5FM	3.5	7,421	168	6	35	C
Portugal						
CT1CO	All	83,750	300	43	82	C
Roumania						
YO3LM	All	15,048	135	23	65	A
YO2KAB	"	12,312	175	14	43	B
YO5KAD	"	8,432	86	23	45	B
YO3ZA	"	5,885	69	22	33	A
YO3FT	14	27,202	225	23	44	-
YO3RF	"	4,448	59	12	20	B
YO2KAC	"	3,240	50	14	22	A
YO7DL	3.5	3,840	125	5	25	A
Saarland						
9S4AX	All	69,823	280	42	89	B
9S4BS	"	62,880	270	40	91	B
Scotland						
GM3EOJ	All	44,462	204	32	62	B
GM8SQ	"	3,332	55	12	22	-
Sicily						
IT1TAI	All	320,950	639	73	172	B
IT1ZWS	21	6,624	91	7	29	B
IT1AGA	14	9,540	108	12	33	A
Soviet Union European Russia						
UA3BJ	14	10,971	176	15	38	B
Estonia						
UR2AK	All	28,320	200	24	72	B
Spain						
EA1AB	All	149,720	500	47	105	C
EA1CP	"	75,544	308	43	90	C
EA3GF	"	44,712	248	28	44	C
EA2CR	"	12,936	106	21	35	-
EA5BS	"	1,872	42	8	16	A
Sweden						
SM5AQW	All	166,428	483	57	150	C
SM5AQZ	"	97,716	261	67	137	-
SM5CXF	"	39,900	195	40	93	C
SM6PV	"	15,570	97	27	63	C
SM3AXM	"	13,440	112	18	42	B
SM6CZE	"	10,125	75	29	52	B
SM7BDK	"	3,640	78	11	37	A
SM7BAH	"	2,584	51	12	26	B
SM5CZD	"	2,470	63	9	29	-
SM6CCB	"	1,012	16	11	12	-
SM3AST	"	72	4	2	4	B
SM3AKM	28	6,441	53	19	38	-
SM5CO	"	5,104	45	17	27	C
SM7BVO	21	38,625	203	25	50	B
SM3AU	"	5,544	60	15	29	B
SM2CSA	"	4,686	65	13	20	-
SM5YG	"	4,356	51	15	29	-
SM5BRO	"	2,244	32	13	21	B
SM4BEC	14	45,360	297	25	47	C
SM5AHK	"	26,880	234	26	58	-
SM5IZ	"	21,952	98	29	69	C
SM5CCE	"	19,880	98	29	51	B
SM3ACP	"	14,695	139	23	50	B
SM7MS	"	13,783	96	25	52	B
SM3ATY	"	13,382	129	19	39	B
SM5TL	"	10,808	100	22	34	C
SM5AHL	"	10,304	99	20	44	C
SM1BVQ	"	8,533	120	17	36	B
SM5BGS	"	6,890	76	15	38	-
SM5BPJ	"	2,320	37	12	28	B
SM7TQ	"	2,275	31	15	20	C
SM5ARR	"	1,200	39	5	18	-
SM7BAU	7	10,251	176	11	40	C
SM5DX	"	6,762	142	10	36	B
SM5WM	"	6,000	97	12	36	-
SM6APB	"	3,290	80	8	27	C
SM7AAZ	"	2,590	48	9	28	-
SM7CPB	"	2,250	101	4	21	A
SM5AJU	"	1,728	63	5	22	B
SM5BRS	"	936	39	5	21	A
SM2CFG	"	320	17	4	12	B
SM7BBN	"	144	13	3	9	A
SM5UQ	3.5	2,184	88	4	22	B
SM6JY	"	1,340	68	3	17	B
Switzerland						
HB9MO	All	99,414	284	61	128	C
HB9UB	"	65,526	275	43	91	-
HB9QA	"	378	17	6	15	A
HB9MU	21	30,124	196	20	48	B
Trieste						
I1NU/T	All	32,680	190	27	68	C
I1BLF/T	21	12,996	200	9	29	-
I1YCZ/T	14	3,870	63	11	32	A
Wales						
GW3HJR	All	31,458	160	35	63	B
Yugoslavia						
YU3BC	All	444,528	613	102	241	C
YU4HA	"	80,620	383	39	100	-
YU2DU	21	8,651	107	14	27	-
OCEANIA						
Australia						
VK2GW	All	317,012	664	66	98	B
VK2PV	"	105,490	336	43	67	B
VK2ADE	"	101,260	287	53	69	-
VK5WO	"	17,664	130	24	22	B
VK5JT	"	10,150	117	13	16	B
VK6RU	"	205,209	468	60	91	B
VK7WA	"	3,822	51	16	10	B
VK2JX	28	16,480	140	16	24	B
VK1ALR	14	10,440	120	15	14	B
VK2AIR	"	42,245	209	28	43	B
VK3AMR	"	61,410	309	25	44	B
VK3CX	"	23,077	172	18	29	B
VK3HL	"	4,256	54	13	15	B
VK7UW	"	47,750	323	18	32	B
VK7CH	"	30,448	242	17	27	B
VK3XB	7	3,495	81	8	7	B
Cook Is.						
ZK1BS	All	85,695	351	45	42	B
Hawaii						
KH6IJ	All	560,952	1183	63	96	D
KH6MG	"	351,372	675	75	103	D
KH6AYG	"	208,525	898	46	49	D
KH6PM	21	90,750	471	25	41	C
New Caledonia						
FK8AO	All	84,736	247	57	71	B
New Zealand						
ZL1MQ	All	149,628	461	52	59	B
ZL1MT	"	22,326	135	33	28	A
ZL2SS	21	42,332	192	29	47	B
ZL4BO	"	34,380	199	24	36	B
ZL1TB	14	3,213	65	9	8	B
ZL4CK	"	12,510	141	13	17	B
Papua Territory						
VK9XK	All	261,800	552	67	103	B
Ryukyu Is.						
KR6SF	21	6,480	52	18	30	C
SOUTH AMERICA						
Argentina						
LU8FBH	All	27,690	240	18	21	-
LU8BAJ	21	22,512	162	20	28	C
LU5CK	"	5,168	57	16	18	-
LU7AS	14	119,325	369	33	78	C
LU5AQ	"	51,392	319	23	41	C
Brazil						
PY7AN	All	267,094	555	57	109	-
PY2AJK	"	168,872	386	54	98	C
PY1RW	"	53,750	233	36	50	-
PY7ACQ	"	36,080	143	31	57	-
PY1AZO	"	3,570	60	13	17	-
PY1HQ	28	39,944	255	18	34	B
PY1ANR	"	35,568	213	19	38	-
PY3QX	21	35,700	176	24	46	-
PY2BNX	"	30,628	173	23	39	B
PY4AO	14	34,645	189	24	41	-
PY2AL	"	1,188	45	5	4	-
PY1NAN	"	594	24	5	4	A
PY7AFK	7	6,912	97	8	16	-
PY7ABQ	"	324	12	5	4	-
Chile						
CE3AG	All	508,396	646	104	167	D
CE4AD	"	106,176	428	37	47	C
Guiana, Dutch						
PZ1AH	All	26,988	123	31	47	B
PZ1AP	14	40,704	290	16	32	B
Netherlands, W. I.						
PJ2AA	All	6,279	94	12	11	-
PJ2AN	21	25,783	152	21	38	B
Peru						
OA4J	14	2,880	85	7	5	B
Uruguay						
CX1FB	All	63,858	255	42	45	B
CX2CO	"	24,940	198	19	24	D
CX2AM	14	12,960	130	13	23	B
CX1BZ	"	7,028	91	13	15	D
Venezuela						
YV5DE	All	66,501	283	36	45	B
YV5BJ	"	35,145	173	29	41	-

CW SECTION MULTI-OPERATOR

NORTH AMERICA						
United States						
W1ICP	All	262,944	399	80	169	D
(W1ICP-W1CPO-W1YGK)						
W1WAI	All	64,883	157	68	[illegible]	B
(W1WAI-W1WAJ-W1FAN)						
K2JLQ	All	30,485	124	35	56	B
(K2JLQ-K2GLQ-K2ETJ)						
K2LYC/2	All	17,854	86	30	49	B
(K2LYC-K2IJF)						
K2IEG	All	12,672	72	20	46	D
(K2IEG-K2KYK)						
W2FXZ	All	11,900	66	23	37	B
(W2FXZ-K2KFP)						
W3VKD	All	373,449	501	[illegible]	183	D
(W3VKD-W3WGH)						
W3FYS	All	89,444	199	63	105	-
(W3FYS-W3NPZ)						
W3PZW	All	63,700	186	48	82	D
(W3PZW-W3WV)						
W4AQL	All	9,522	55	28	41	[illegible]
(W3YEK-W4GGR)						
W6DFY	All	561,660	632	118	212	D
(W6DFY-W6FUF-W6ILP-W6ZAT)						
W6UED	All	499,235	602	118	195	D
(W6UED-K6ELX-K6EVR-K6JQJ)						
W6NJU	All	395,063	517	117	172	D
(W6NJU-W6HJK-W6RW-K6CEO-K6LGF)						
W8VPC	All	33,800	152	56	48	B
(W8VPC-W8TJQ)						
WØLNI	All	8,642	51	27	31	C
(Club)						
WØWDK	All	966	16	11	10	C
(WØWDK-WØYSE-KØCZQ)						
K5AUZ	21	18,410	114	26	44	B
(K5AUZ-K5CAO)						
W7WJC	21	12,882	89	22	35	A
(W7WJC-W7WJB)						
W8TTN	21	4,592	44	18	23	B
(W8TTN-W8GKB-W8QZA)						
W3BYX	14	3,034	42	14	23	C
(W3BYX-W3DAO)						
W4KFC	14	91,461	259	36	93	B
(W4KFC-KOAZJ)						
W6VSS	14	111,276	306	37	95	D
(W6VSS-K6CZY)						
W6MUR	14	88,320	203	39	121	D
(W6MUR-W6PLK)						
W6CPL	14	64,410	209	36	78	D
(W6CPL-W6CCP)						
W6AM	14	64,410	209	36	78	D
(W6AM-W6BXL-W6KFV-W6TMD)						
K6EYT	14	31,680	167	28	44	D
(K6EYT-K6OIZ)						
W7QGF	14	58,760	188	36	77	D
(W7QGF-W7DL)						
K6EGF/6	7	4,114	49	16	18	C
(K6EGF-K6CVU-K6CYT)						
Alaska						
KL7PJ	14	102,691	487	35	68	D
(KL7PJ-KL7MF)						
KL7BES	14	3,312	102	11	12	B
(KL7BES-KL7BWR)						
Canada						
VO6U	All	21,952	298	29	35	C
(VO6U-VO6AE)						
VE2ADX	14	1,048	131	4	4	B
(Club Station)						
Africa						
ZS5JM	All	275,652	555	62	109	B
(ZS5JM-ZS5VJ)						
ASIA						
Ceylon						
4S7GE	All	88,646	252	42	85	B
(4S7GE-4S7LU)						
Formosa						
BV1US	All	148,097	402	53	84	D
Japan						
KA3CY	14	69,680	307	30	50	D
(KA3CY-K8BGI)						
EUROPE						
Belgium						
ON4BU	All	53,734	267	42	92	-
(ON4BU-ON4EC)						
Bulgaria						
LZ1KBD	All	194,346	540	55	128	B
(Club Station)						
LZ1KDP	All	136,213	409	56	147	B
(Club Station)						
LZ1KPZ	All	70,700	374	29	71	B
(Club Station)						
LZ1KAB	All	39,936	302	24	54	C
(Club Station)						
LZ2KST	All	35,700	230	30	70	B
((Club Station)						
LZ1KDA	All	28,078	261	27	74	B
(Club Station)						
LZ1KBL	All	6,912	130	10	38	A
(Club Station)						
LZ2KLR	All	609	32	7	14	A
(Club Station)						
Czechoslovakia						
OK1KTW	All	167,092	391	73	153	B
(Club Station)						
OK1KCI	All	31,125	181	37	88	B
(Club Station)						
OK1KAL	All	672	30	6	18	A
(Club Station)						
OK2KTB	14	1,953	48	8	23	B
(Club Station)						
OK1KBI	7	2,727	105	5	22	B
(Club Station)						
OK1KDR	7	1,633	68	4	19	B
(Club Station)						
OK3KES	7	1,500	58	5	20	B
(Club Station)						
OK2KLI	3.5	500	32	4	16	B
(Club Station)						
England						
G3AIM	All	36,308	150	38	78	B
(G3AIM & others)						
G2BOZ	14	61,442	339	25	62	B
(G2BOZ-G3HCT-G3HDA)						
Germany						
DJ3JZ	All	193,248	528	59	117	[illegible]
(DJ3JZ-DJ1BP-DL1CR-DL3AO-DL9CI)						
DL1IN	All	155,760	371	60	116	B
(DL1IN-DL1JN-DL1ZN)						
DL4ME	All	108,630	367	510	120	C
(DL4ME-DL4HI-DL4EB-DL4WA-DL4BX)						
DL4YE	14	48,564	303	25	51	C
(DL4YE-DL4RI)						
Italy						
I1BDV	All	190,748	477	56	112	-
(I1BDV-I1BDT-I1TOB)						
I1SXZ	All	112,428	418	47	115	[illegible]
(I1SXZ-#10150-#10011)						
Netherlands						
PI1RRS	All	68,949	261	51	90	-

The neat lay-out at DL1QT

Ken Bradley, ZS2HI, high scoring All Bander from South Africa.



Art Lewis and "Van" Blitter at a recent visit to W3VKD's shack. Van, stateside W6HHI was the original BV1US and one of the Ops in the CW Contest.

←K9CLO—1st place winner on 20.

Call	Band	Pts.	QSOs	Zns	CC
		Poland			
SP1KAA	All	92,235	337	43	10
(Club Station)					
SP9KAD	All	4,516	68	12	34
(Club Station)					
SP6KBE	7	5,775	149	7	28
(Club Station)					
SP3KAU	3.5	3,213	135	4	23
(Club Station)					
SOVIET UNION:		Estonia			
UR2KAA	14	72,744	492	26	58
(Club Station)					
		Lithuania			
UP2KBC	All	69,258	442	30	89
(Club Station)					
OCEANIA		Hawaii			
KH6CBP	All	448,762	884	72	101
(KH6CBP, Jr.-KH6CBQ, Sr.)					
		Ryukyu Is.			
KR6QW	14	29,232	203	20	28
(KR6AH-KR6EM-KR6OF-KR6OZ)					
NOVICE					
KN4GMT	All	12,416	81	27	37
KN9DCF	"	192	14	9	7
KN9CAZ	21	3,080	40	15	20
KN0EEO	"	14	11	4	3
KN0DQI	"	12	8	2	2

CW - CHECK LOGS

G3EEM-GI4RY
JA1CC
K2DEM
K4AWJ
K6IEC
KL7DR
KR6RY
LU5AQ-LU8BAJ
LZ1KAB
OH2KJ-OK2LU
OK1JX-OK1NB-OK2AG-OK2KLI-OK2E
OZ2NU-OZ8QW
PA0ZV
PY4AO
SM3AKW-SM3AU-SM4ANS-SM5HH-SM
VK2OW-VK3KS-VK3XB
VR3B
VU2MD
W2GT-W2GVZ-W2AIS/KH6
W3HH-W3HDV-W3RRI/3
W6JBP-W6TRR
W8IF
W0IUB
YO2-976
ZE5JE
4X4II

CLUB SCORES

So. Calif. DX Club	3,431,
Potomac Valley RC	2,053,
Ohio Valley ARA	1,440,
Frankford RC	596,
Maui ARC	536,
West Gulf DX Club	469
Japan DX RC	466,
Nassau RC	397,
Ind. Cty ARC	373,
No. Calif DX Club	347,
Laurel ARC	262,
Siemens RAC	256,
Willamette Valley DX Club	252,
Radio Society of Harrow	226,
Anchorage ARC (Alaska)	217,
Central Michigan RC	160,
Redding RC	147,
Nowstrn Virginia DX Club	143,
Rochester DX Assoc.	101,
Ridgewood NJ RC	96,
Baltimore ARC	50,
San Deigo SX Club	31,
Goose Bay ARC	30,
Egyptian RC	29,
Polar ARCK of Alaska	12,
Central High (Sioux City) RC	9,
So. Shore ARC	6,
Milwaukee RAC	6,
West Park Radio Operators	6,
RA of Greater Syracuse	5,
Hamden County(Mass) RC	4,
Columbus ARA	2,
Willimantic RC	1,
Central RC of Czechoslowakia	1,611,
DARC (Germany)	314,
Central RC of Bulgaria	294,
LPZ (Poland)	221,
URE (Spain)	134,
Lega dos RE de Mocambique	120,
VERON (Netherlands)	5,
Central RC of Roumania	4,
Sveriges Sunndarcania Sorei(SSA)	3,
REF Madagascar	1,

Russ Martin operating W3ECR placed sixth in the Top Ten.

artin must have concentrated on a multiplier ecause they worked all zones except number 3 and their 121 countries, on one band mind ou, was far ahead of anything we received. e still think that the All Band groups should o better.

Returns from the newly created Novice diision were very poor. However we must menon the fine efforts of KN4GMT and KN9CAZ.

There was the usual cry from the QRP bys. Quote W7MQY, "8 years of tearing out y hair chasing DX with low power." You n relax now Yul Brynner, your 28 mc rtificate will shortly be in the mail.

Altho we hardly recommend this for chasing X, JA3SW, SM7CPB, SM5BRS and SM7BBN d it with only 5 watts.

The YLs were in the pile ups too, to menon a few, W3AMA, W7QGF, KZ5KA, A0ULA and VE5DZ.

The Committee is always open to construcve suggestions and to prove it we took C6FQ's suggestion of raising the B power ass to 150 watts and W8RQ's idea of more an one award per division. Therefore in ountries and districts where we feel the rerns justify additional reward we have given cond and in some cases third place cerficates.

A total of 874 logs from 89 different counies were received, an increase of 35 per cent ver last year. The total receipts from both hone and CW was 1383 logs from 109 difrent countries. An all around increase over evious years but still not up to our exctations.

All the criticism should not come from the ontestants. We on the Committee also have ır gripes. Too many logs are still coming ıru unscored and with a lack of the vital formation we need to properly judge them. elieve it or not some even failed to note ıe band they were operating. Many well nown stations that were heard taking active art during the contest period, did not bother send in a report, making our checking probm more difficult. There is no excuse for Z1WD's remark, "I cannot understand why many W hams did not know the rules."

In closing I want to again express my thanks my very effective and hard working comittee. Guy Flower W1DHO, "Mac" McIntire /2BO, Ben Lazarus W2JB, Ray Yard W2DKF nd our helper Warren Wade KN2ERS.

73, Frank, W1WY

Bill Bruning and his shack at K6IYJ. (One of the So. Calif. gang).

CE4AD — Adalberto Brito from down South America way.

Claude Ronsiaux — F9MS who can always be found in a contest.

Sunburn Cream Handy?

Better get your ladder out and ready to use for certainly one or two of the antenna articles in the July CQ will send you running out into the yard, wire in hand. Gloryowsky, but we have antenna articles next month.

PROPAGATION

George Jacobs, W3ASK
Registered Professional Engineer
607 Beacon Road,
Silver Spring, Md.

Summer Propagation

In the mysterious, complex motions of the solar system, the earth travels around the sun annually in an orbit called an *ecliptic*. Because of the ecliptic the overhead position of the sun appears to move from 23½ degrees south latitude to 23½ degrees north latitude and back again in one year's time. During June the sun is at its most northern point in its celestial travels. Meteorologically, in the northern hemisphere, this marks the beginning of the summer season bringing with it warmer and longer days. At the *summer solstice* (a celestial term applied to this period), not only is the sun highest in the northern skies but it is also at its *greatest* distance from the earth. On July 3rd, for example, the sun will be 94½ million miles from the earth, while on January 3rd it was a mere 91½ million miles away. This angular relationship between the sun and the earth has a direct effect on shortwave radio propagation conditions since it is ultraviolet radiation, originating from the sun and sweeping across the earth's upper atmosphere, that is believed responsible for producing the ionized layers which reflect high frequency radio waves.

Last Minute Forecast

Based upon the recurrence tendency of short wave radio storms, the periods June 2-3, 10-11 and 16-18 are expected to be unsettled or disturbed. Ionospheric conditions during the remainder of the month should be relatively stable.

Sunspot Cycle . . . The Zurich monthly relative sunspot number for March, 1957 was 157.

Heat radiated from the sun during June and the summer months strikes the earth more directly than during other seasons. This direct, and therefore more intense heat radiation causes the gases that exist in the region of the ionosphere to expand. As a result of this expansion the electronic density of the ionosphere, or the degree of ionization, *decreases*. This results in a weaker F-2 layer, with lower maximum usable frequencies, during the *daylight* hours of the summer months as compared to other seasons. This will be particularly noticeable on 10-meters where fewer DX openings are forecast.

On the other hand, during the summer months the hours of daylight far exceed darkness, thus permitting the layers of the ionosphere to absorb ultraviolet radiation for longer periods of time, with less time for de-ionization to take place. This results in considerably stronger ionization during the late afternoon and evening hours with less of a change between day and night MUF's than is observed during other seasons.

During June and the summer months ionospheric absorption tends to increase and signal levels during the daylight hours may be somewhat weaker than they were during the winter months. Atmospheric noise levels (static) also increase during June, reaching a peak dur-

Fig 1

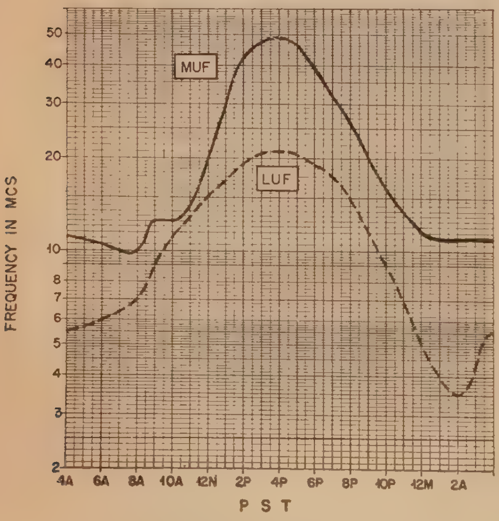
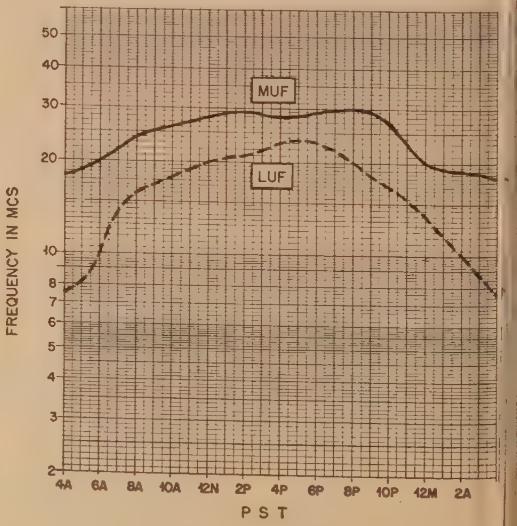


Fig 2



ing the summer months. There is also a tendency for a sharp increase in sporadic-E, short-skip, propagation during June on frequencies as high as the amateur 6 meter-band. Sporadic-E propagation is discussed at greater length elsewhere in this column.

Fgures 1 and 2, propagation analysis curves for the path between California and Japan, graphically show typical seasonal variations in propagation conditions between the winter and summer months.

Expanded Forecast

Since June marks the beginning of the summer propagation season, this month's *CQ DX Propagation Charts* have been expanded to include an analysis of nearly twice as many circuits as usual.

Propagation Conditions—June

The following is an overall picture of band conditions forecast for June, 1957, with a discussion of the qualitative changes in each amateur high frequency band from month to month. For specific times of band openings for a particular DX circuit, refer to the *CQ Propagation Charts* on the opposite page.

6 Meters:

No F-2 layer long distant openings expected. Occasional openings between distances of 1000 and 1400 miles should occur as a result of increased sporadic-E type propagation. Intense daylight meteor showers between June 2nd and 14th may also produce some unusual short-skip openings on this band.

10 Meters:

Seasonally lower daytime MUF's results in fewer 10-meter openings during June. Because of high solar activity however, the band should open to most areas of the world on at least a few days during the month, peaking during the late afternoon and early evening hours. A sharp increase is expected in short-skip, sporadic-E type openings between distances of 600 and 1300 miles.

15 Meters:

This will be the best daytime DX band during the summer months. World-wide openings are expected on many days, peaking just after sunrise and during the late afternoon and early evening hours. A considerable increase is expected in short-skip openings between distances of 600 and 2200 miles.

20 Meters:

Twenty meters should be the best DX band during the hours of darkness. From late afternoon until a few hours after sunrise good propagation conditions are forecast to most areas of the world. During daylight hours, increased solar absorption will limit most openings to distances between approximately 300 and 2000 miles.

40 Meters:

Fair DX propagation conditions are forecast for some nights from shortly after sundown until shortly after sunrise. During the daylight hours, seasonally high absorption will limit openings to short-skip distances between approximately 100 and 750 miles.

[*Continued on page 77*]

ALL TIMES IN PST

WESTERN USA TO:	10/11 Meters	15 Meters	20 Meters	40/80 Meters
Northern South America	7A-11A (3) 11A-5P (4) 5P-8P (3)	5A-2P (3) 2P-7P (5) 7P-1A (4) 1A-5A (3)	8A-2P (2) 2P-8A (5)	7P-2A (3) 9P-1A (2)*
Argentina, Brazil & Chile, Etc.	6A-10A (2) 10A-4P (4) 4P-7P (2) 7P-9P (1)	4A-7A (3) 7A-2P (2) 2P-7P (4) 7P-11P (3) 11P-4A (1)	1P-4P (2) 4P-12M (4) 12M-4A (2) 4A-6A (3)	7P-3A (2) 9P-12M (1)*
West & Central Europe	NIL	1P-3P (2) 3P-5P (3) 5P-7P (2) 7P-12M (1)	3P-5P (1) 5P-11P (2) 11P-1A (1)	NIL
Southern Europe & North Africa	2P-5P (1)	9A-12N (1) 12N-8P (3) 8P-11P (2)	3P-6P (2) 6P-10P (3) 10P-2A (2)	7P-10P (1)
Central & South Africa	4P-8P (2)	11A-1P (1) 1P-3P (2) 3P-8P (3) 8P-12M (2)	4P-6P (2) 6P-9P (3) 9P-11P (2)	7P-11P (1)
Tahiti & Oceania	10A-6P (2) 6P-11P (1) 11P-4A (3)	9A-6P (3) 6P-4A (4) 4A-9A (2)	5P-7P (2) 7P-7A (4) 7A-10A (3) 10A-12N (2)	7P-7A (3) 8P-6A (2)*
Guam & Mariana Islands	12N-4P (1) 4P-6P (2) 6P-8P (3) 8P-11P (2)	7A-1P (3) 1P-8P (1) 8P-12M (3) 12M-7A (1)	8P-12M (2) 12M-8A (4) 8A-10A (3) 10A-12N (2)	1A-6A (2) 2A-5A (1)*
Fiji & Pacific Islands	11A-1P (3) 1P-8P (4) 8P-2A (3)	8A-6P (2) 6P-3A (4) 3A-8A (3)	7P-11P (2) 11P-8A (4) 8A-11A (3)	12M-7A (2) 2A-6A (1)*
New Zealand	11A-1P (3) 1P-8P (4) 8P-10P (2)	9A-12N (2) 12N-5P (1) 5P-9P (3) 9P-12M (2)	6P-8P (2) 8P-12M (3) 12M-8A (2)	11P-6A (2) 1A-5A (1)*
Australia	12N-2P (3) 2P-10P (4) 10P-12M (2)	11A-1P (2) 1P-8P (1) 8P-12M (3) 12M-3A (2)	7P-10P (2) 10P-4A (4) 4A-8A (3) 8A-10A (1)	9P-12M (1) 12M-4A (2) 4A-7A (1) 11P-2A (1)*
Philippine Islands	2P-4P (1) 7P-11P (2)	1P-10P (1) 10P-2A (3) 2A-7A (2) 7A-1P (3)	10P-2A (2) 2A-8A (3) 8A-11A (2)	3A-6A (1)
East Indies	8A-11A (1) 2P-10P (1)	7A-12N (2) 12N-3P (1) 10P-2A (1)	12M-6A (1) 6A-9A (2) 9A-12N (1)	NIL
Malaya & South-East Asia	10A-2P (1) 6P-9P (2)	7A-11A (3) 11A-2P (2) 10P-2A (1)	12M-2A (1) 2A-7A (2) 7A-12N (3) 12N-2P (1)	3A-6A (1)
Hong Kong, Formosa, Etc.	2P-10P (2)	7A-12N (3) 12N-8P (2) 8P-2A (3) 2A-7A (1)	10P-2A (2) 2A-8A (3) 8A-1P (2)	2A-6A (1)
Japan, Okinawa & Far East	11A-4P (1) 4P-10P (2)	7A-9A (3) 9A-12N (4) 12N-7P (2) 7P-12M (3) 12M-2A (1)	9P-12M (2) 12M-9A (3) 9A-12N (2)	2A-6A (2) 3A-5A (1)*
Siberia	1P-4P (1) 10P-2A (1)	4A-10A (3) 10A-1P (4) 1P-8P (3) 8P-4A (4)	7P-10P (3) 10P-8A (4) 8A-12N (3) 12N-7P (2)	1A-6A (3) 2A-5A (2)*
India	8A-12N (1) 7P-11P (2)	12M-2A (1) 2A-6A (2) 6A-10A (3) 10A-2P (1)	2A-6A (1) 6A-10A (2) 10A-12N (1)	NIL

SB

Bob Adams, W3SW
919 McCeney Road,
Burnt Mills Hills,
Silver Spring, Md.

Countries Worked (Two-way SB)

W2KR	81	W2CFT	67
K2DW	78	W2EWL	66
DL4SV	76	W2JXH	66
W3BZ	76	HR2WC	64
K2AAA	74	W8JXM	63
W3ZP	73	W6IAL	61
G3MY	73	W5HHT	61
G6LX	72	OH20J	61
ZL3IA	71	W1EQ	61
ZL3PJ	73	PA0IF	60
ZS6KD	73	CN8MM	60
VE4NL	71	F7AF	60
W4INL	70	W9GPI	60
VE2GQ	68	K2GMO	60
VK3AEE	68	W3HN	61

We are now approaching the time of year when fishing and golf interferes with DX, but from the looks of the Countries Worked list the boys are still finding some time for listening for the rare ones. A new country will make its appearance on July 21st, namely Aland Islands, OH0OJ. Sam, OH20J and his XYL OH2QJ will leave Helsinki on July 20th, taking with them a W2EWL exciter and amplifier, and a converted BC-453 and product detector for the receiver. Operation will be on SB only on twenty and fifteen meters. Sam says he will try to stay on the Island for the entire three weeks of his vacation if his money holds out. This is a real rare one, so get set for the 21st of July.

Mike, G3MY who worked 53 new countries so far this year to bring his total to 73. He advises that E14E is back after two years absence and will operate on 15 and 20. Mike also writes that VS2BD is on 14287.5, xtal controlled on the lower SB only, and that two other VS2 stations are building exciters.

CR9AH, CR9AK and CR9AL should be making their appearance any day according to VS6AZ.

Another famous DXer, PY2CK, James will be on SB with a KWS-1 on his return from the States in May.

Bob, K2GMO finally made the grade by working K4LIB/FQ8, ZD4BF and YV5FH for a total of 60 in only four month's operating.

Rolf, DL1UX, who rides a motor bike from home to his shack in the country reports a total of 44 countries on SB. All the equipment is home-made including his 50 foot tower. The receiver has twelve tuned circuits, with xtal converters for each band into a very low freq. I.F. which gives excellent selectivity. The transmitter is an all-band phasing-type exciter and a class B final running 250 watts input.

We are pleased to brighten up our column with a picture of Dorthy, K2MGE, who is one of the few XYL or YLs to operate SB. Dot who has four young harmonics to care for still finds plenty of time to operate twenty. Her rig is a 20-a driving a pair of RK65A's into a Gonset Minibeam. The receiver is a 75A2.

Al, W8DLD, with the rock-crusher Mobile rig on SB participated in the SB Contest and worked F7AF, OA3L, ZS6KD, KV4BQ, CX5AF, TG9AD, F7RQ, CN8MM, KP4AB, G3MY, G6LX, GM3CIX, DL1JV, KH6EM, SM5OH, DL4JG, and 5A5TH, on 15 through all the heavy QRM. Al has now worked 55 countries on SB from his mobile rig and promises to send us the details of the equipment for publication.

Sam, W3HN who has now worked 61 countries with his 304TL is planning a new antenna system. Sam who is Station Engineer of WRC-TV in Washington attended the SB dinner.

Wally, KZ5WZ sent in a photo of his rig and himself with a note that "in case the column hits rock bottom and there is nothing else to run then here is something to fill up some space". We can add that his big signal from the Canal Zone sure fills up the space on twenty.

Bill, KL7BPW a former member of the Mid-nite Sun Radio Club will soon be operating SB in plenty of sunshine in KP4-land. He uses a 20A driving four 6AG7's grounded grid.

The "other Bob Adams" OD5BZ in Lebanon sent in a swell photo of his rig which has now worked 48 countries in ten weeks of operation. He has participated in two WAC-SB roundtables on twenty meters. Bob has now worked 236 W/K stations as follows: 14-W1, 55-W2, 15-W3, 27-W4, 16-W5, 37-W6, 5-W7, 34-W8, 17-W9 and 16-W0. OD5BZ uses a Telrex Super-Mini Beam.

Cyrl, VK3AEE who has been one of the early pioneer SB stations "down under" sent in his log for the SB DX Contest showing 248 contacts with 36 countries for a total of 726 points. This would qualify him for 10th place

G2MF

OZ3EA

OZ7BO

PA0IF

F7EM

F7EB

DL4KS

DL4SV

DL4OX

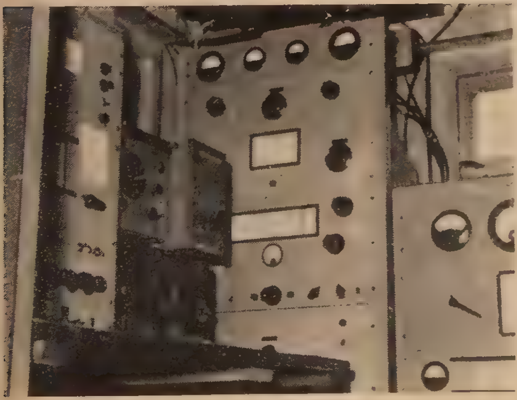
OZ7T

G3MY

The 11 small pictures above and left were taken by W2CFT, AL, on his recent trip to Europe.

KZ5WZ

DL1UX and antenna



Mort, W2KR and new shack.

G6LX QSO'ing G2MF at K2DW

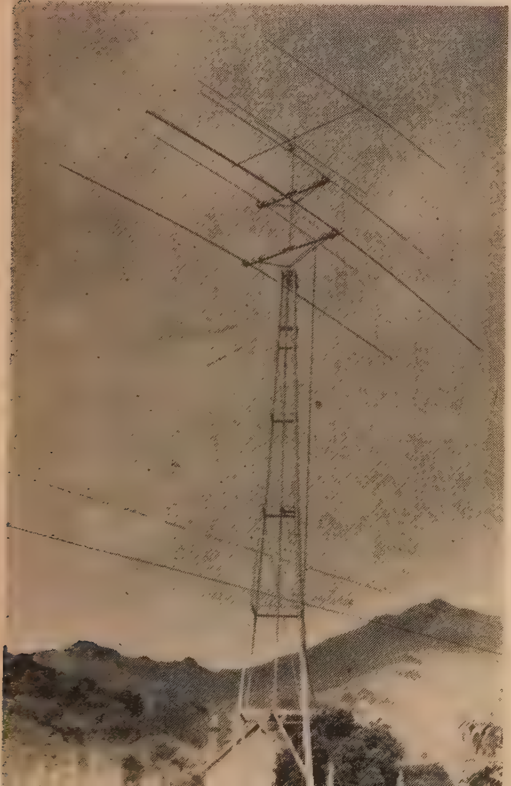
K2MGE

in the contest. Congrats Cyrl!

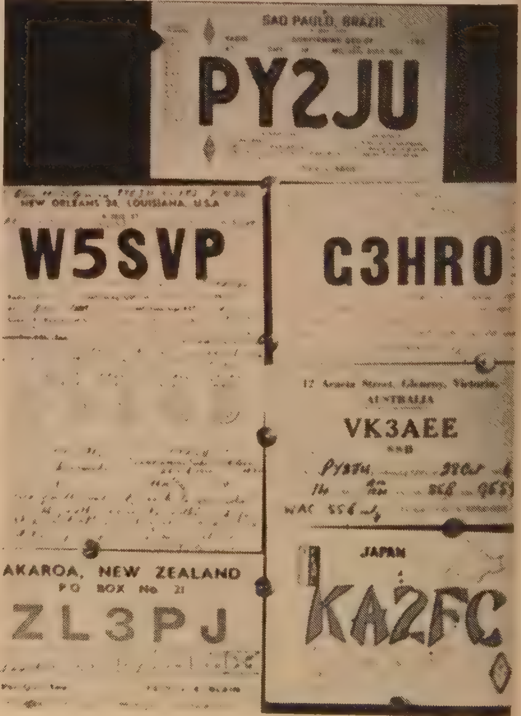
The Single Side-Band Dinner held during the Daytonhamfest was a huge success and more than 75 sidebanders were in attendance. Your conductor accompanied by Bill Halligan, W9AC thoroughly enjoyed ourselves. There were more than two thousand Hams attending the Hamfest which is probably the most important event of its kind held. Many interesting exhibits were shown, featuring the latest SB gear. A highlight of the Hamfast was the fact that nearly every exhibitor featured SB equipment.

Your Editor who is now setting up an antenna farm at a new QTH near Washington, must again start from scratch in the DX race. The location was selected carefully with a

[*Continued on page 104*]



Antenna at ZL3IA



SAO PAULO, BRAZIL

PY2JU

NEW ORLEANS 24, LOUISIANA, U.S.A

W5SVP

G3HRO

12 Acacia Street, Glenroy, Victoria,
AUSTRALIA

VK3AEE

SSB

AKAROA, NEW ZEALAND
P O BOX No 21

ZL3PJ

JAPAN

KA2FC

1st SB 20m WAC QSL's (Oct. 26th, '56)

Propagation *[from page 73]*

ALL TIMES IN EST

EASTERN USA TO:	10/11 Meters	15 Meters	20 Meters	40/80 Meters
Northern South America	7A-11A (3) 11A-5P (4) 5P-7P (3) 7P-10P (2)	7A-5P (4) 5P-7P (5) 7P-1A (4) 1A-7A (3)	9A-4P (3) 4P-9A (5)	7P-5A (3) 11P-5A (2)*
Argentina, Brazil & Chile, Etc.	7A-11A (2) 11A-6P (3) 6P-9P (2) 9P-12M (1)	5A-9A (3) 9A-2P (2) 2P-11P (4) 11P-5A (2)	3P-5P (2) 5P-2A (4) 2A-8A (3)	7P-1A (2) 1A-6A (3) 1A-5A (1)*
Western Europe	11A-2P (1) 2P-5P (2) 5P-7P (1)	6A-1P (2) 1P-7P (4) 7P-10P (2)	5A-1P (1) 1P-4P (3) 4P-10P (4) 10P-5A (3)	7P-11P (3) 11P-1A (2) 8P-12M (2)*
Scandanavia & North Europe	11A-2P (1) 2P-5P (2) 5P-7P (1)	7A-1P (1) 1P-5P (2) 5P-8P (3) 8P-10P (1)	1P-5P (1) 5P-11P (2) 11P-7A (1)	7P-1A (1) 8P-11P (1)*
Balkans & Near East	12N-3P (1) 3P-5P (2) 5P-7P (1)	5A-11A (1) 11A-3P (2) 3P-7P (3) 7P-10P (2) 10P-1A (1)	12N-4P (1) 4P-11P (3) 11P-3A (2) 3A-6A (1)	7P-11P (2) 8P-10P (1)*
Southern Europe & North Africa	9A-12N (1) 12N-3P (2) 3P-5P (3) 5P-7P (1)	5A-8A (2) 8A-12N (1) 12N-7P (4) 7P-10P (2)	1P-5P (2) 5P-1A (4) 1A-7A (2)	7P-1A (3) 9P-12M (1)*
West & Central Africa	9A-12N (1) 12N-7P (3) 7P-9P (1)	5A-11A (2) 11A-2P (3) 2P-8P (4) 8P-11P (2) 11P-5A (1)	1P-5P (2) 5P-1A (4) 1A-7A (2)	7P-2A (2) 9P-12M (1)*
East Africa	3P-5P (1) 5P-8P (2)	9A-12N (1) 12N-2P (2) 2P-7P (3) 7P-11P (2)	2P-6P (2) 6P-10P (3) 10P-1A (2)	7P-9P (1)
South Africa	7A-11A (2) 11A-3P (3) 3P-7P (2)	1A-5A (2) 5A-11A (1) 11A-7P (3) 7P-10P (2)	1P-5P (2) 5P-9P (3) 9P-1A (2) 1A-5A (3)	7P-2A (1)
Pakistan/India	NIL	11A-4P (1) 4P-10P (2)	5P-9P (1) 9P-12M (2) 6A-8A (1)	NIL
Central Asiatic USSR	NIL	9A-3P (1) 3P-6P (2)	5P-9P (1) 9P-1A (2)	NIL
Formosa, Hong Kong, Etc.	NIL	3P-9P (1)	7A-10A (1)	NIL
Hawaii	6P-11P (2)	7A-11A (1) 11A-5P (2) 5P-11P (4) 11P-1A (2) 1A-3A (1)	5P-10P (2) 10P-3A (4) 3A-7A (3) 7A-9A (4) 9A-12N (2)	12M-7A (5) 1A-5A (1)*
Japan & Far East	NIL	5P-7P (1) 7P-11P (2) 11P-1A (1)	7P-10P (1) 10P-1A (2) 1A-6A (1) 6A-9A (2)	NIL
Guam & Pacific Islands	NIL	5P-7P (1) 7P-11P (2) 11P-1A (1)	7P-10P (2) 10P-2A (3) 2A-6A (1) 6A-8A (2) 8A-10A (1)	NIL
Australasia	5P-11P (2)	6P-11P (2) 11P-1A (3) 1A-6A (1) 6A-10A (2)	9P-1A (2) 1A-8A (3) 8A-9A (2)	1A-6A (2) 2A-5A (1)*
Malaya & South East Asia	NIL	3P-5P (1) 5P-9P (2) 9P-11P (1) 6A-8A (1)	6A-8A (2) 5P-9P (1) 9P-12M (2)	NIL
Philippine Islands & East Indies	NIL	3P-5P (1) 5P-11P (2) 11P-1A (1)	7P-12M (1) 6A-8A (1)	NIL

ALL TIMES IN CST

CENTRAL USA TO:	10/11 Meters	15 Meters	20 Meters	40/80 Meters
Northern South America	7A-11A (3) 11A-5P (4) 5P-7P (3) 7P-10P (2)	6A-4P (4) 4P-7P (5) 7P-1A (4) 1A-6A (3)	8A-3P (3) 3P-8A (5)	7P-4A (3) 10P-3A (2)*
Argentina, Brazil & Chile, Etc.	7A-10A (2) 10A-5P (4) 5P-8P (2) 8P-11P (1)	4A-8A (3) 8A-2P (2) 2P-10P (4) 10P-4A (2)	2P-4P (2) 4P-1A (4) 1A-8A (3)	7P-1A (2) 1A-5A (3) 11P-4A (1)*
Western Europe	11A-1P (1) 1P-4P (2) 4P-6P (1)	7A-12N (1) 12N-2P (3) 2P-6P (3) 6P-9P (1)	12N-2P (1) 2P-4P (2) 4P-11P (4) 11P-3A (2)	7P-11P (2) 8P-10P (1)*
Northern & Central Europe	2P-5P (1)	7A-10A (1) 10A-2P (2) 2P-6P (3) 6P-10P (1)	1P-4P (1) 4P-11P (3) 11P-3A (1)	7P-11P (1)
Southern Europe & North Africa	9A-11A (1) 11A-3P (2) 3P-5P (1)	5A-11A (1) 11A-7P (3) 7P-10P (1)	1P-4P (2) 4P-9P (4) 9P-1A (3) 1A-3A (2)	7P-12M (2) 8P-10P (1)*
Central & South Africa	7A-9A (2) 9A-12N (1) 12N-4P (3) 4P-7P (2)	12M-3A (2) 3A-12N (1) 12N-6P (3) 6P-8P (2) 8P-12M (1)	1P-4P (2) 4P-9P (3) 9P-3A (2)	7P-12M (1)
India	NIL	7A-9A (2) 9A-4P (1) 4P-9P (2)	7A-9A (1) 5P-8P (1) 8P-11P (2)	NIL
Formosa, Hong Kong, Etc.	6P-10P (1)	3P-7P (1) 7P-10P (2) 10P-12M (1)	9P-12M (1) 7A-9A (1)	NIL
Hawaii	1P-4P (1) 4P-11P (2)	7A-3P (2) 3P-11P (4) 11P-1A (3) 1A-4A (2)	5P-7P (2) 7P-4A (4) 4A-6A (3) 6A-8A (4) 8A-11A (2)	10P-7A (3) 12M-5A (2)*
Japan & Far East	7P-10P (1)	3P-5P (1) 5P-7P (2) 7P-11P (3) 11P-1A (2)	5P-8P (2) 8P-1A (3) 1A-8A (2)	NIL
Australasia	4P-9P (2) 9P-11P (1)	3P-7P (2) 7P-11P (3) 11P-2A (2) 2A-6A (1) 6A-9A (2)	7P-11P (2) 11P-4A (4) 4A-7A (3) 7A-9A (2)	12M-6A (2) 1A-5A (1)*
Malaya & Southeast Asia	NIL	1P-4P (1) 4P-9P (2) 9P-11P (1) 6A-9A (1)	6A-8A (1) 5P-11P (2)	NIL
Philippine Islands & East Indies	NIL	2P-5P (1) 5P-11P (2) 11P-1A (1)	7P-11P (2) 6A-8A (1)	NIL
Asiatic USSR	NIL	9A-3P (1) 3P-5P (2) 7P-11P (1)	5P-9P (1) 9P-1A (2) 1A-8A (1)	NIL
McMurdo Sound, Antarctica	1P-5P (2)	12N-2P (1) 2P-4P (2) 4P-7P (3) 7P-9P (1)	4P-6P (1) 6P-9P (3) 9P-12M (2) 12M-4A (3) 4A-8A (2)	9P-11P (1) 11P-2P (2) 2P-6A (1) 12M-4A (1)*

SYMBOLS FOR NUMBER OF DAYS CIRCUIT FORECAST TO OPEN:

(1) 1-4 days (2) 5-11 days (3) 12-18 days (4) 19-26 days (5) over 26 days.

* Indicates possible eighty-meter openings.

Time Symbols:
A - A.M. N - Noon
P - P.M. M - Midnight

The CQ DX Propagation Charts are based upon a CW radiated power of 150 watts at radiation angles less than thirty degrees and are centered on the Eastern, Central and Western areas of the United States. They are valid through July 15, 1957. These forecasts are based upon ionospheric data published by the Central Radio Propagation Laboratory of the National Bureau of Standards, Boulder, Colorado.

80 Meters:

Considerably higher static levels will limit long distant propagation on eighty-meters to less than approximately 2000 miles during the hours of darkness. On nights when static levels are lower than average, DX to some areas of the world may be possible. During the daylight hours absorption will limit maximum range on this band to less than 150 miles or so.

160 Meters:

In response to this column's request for 160-meter propagation data W1BB reports considerable 160-meter DX during February and March. History making initial contacts were made on this band between W1BB and TG9AD in Guatemala and between W1BB and ZB1HKO on Malta.

[Continued on page 81]

YL

Louisa B. Sando, W5RZJ
212 Sombrio Drive
Santa Fe, New Mexico

Results 8th YL-OM Contest

Congratulations to the winners of the 8th Annual YL-OM Contest. Each year the competition gets stiffer and new records were set in both the phone and cw sections. In the phone section (Feb. 2-3) first place was won by W1SCS, Ruthe Ferguson, for the YLs, with a total of 603 contacts in 75 sections. Ruthe has been a consistently top scorer making first in the 1956 phone contest and second in both '55 and '54. Among the OMs, W8AJW Jack Siringer, made the high phone score by working 91 YLs in 37 sections. He, too, is a consistent high scorer, placing second last year on phone, first in 1955 and second in '54.

In the cw section (Feb. 16-17), top score for the YLs was turned in by K5ADQ, Nikki Boyd, who last year held high score for her district. Nikki made 302 contacts in 52 sections. High score for the OMs on cw was run up by K2DSW, Bob Panek, who last year had the highest aggregate (cw and phone) score. He worked 52 YLs in 27 sections.

K5ADQ, Nikki Boyd, top YL scorer in the cw section of this year's YL-OM Contest. Licensed in March '55, Nikki is active on 10 and 20 cw chasing DX (119 countries to date). She checks into the YL nets, holds WAS, YLCC and needs only W. Va. and Tenn. for WAS/YL. OM W5QVZ is a physicist and they have two sons, ages 10 and 5.

Traveling YL W6NZP, Evelyn, during her visit to VK3YL, Austine (right), at Murrumbeena, Vic., Australia, last year.

YL CW

W1RLQ	16,575.00
W1VXC	6,120.00
W1YNI	531.25
W2EFW	3,915.00
K2JYZ	1,500.00
K2DXD	822.50
K2DXL	505.00
K2JBX*	
W3URU	4,687.50
W3TSC	4,526.00
W3CDQ	2,530.00
W3SLS	2,430.00
W4HLF	18,342.50
W4BLR	8,892.00
W3UTR/4	787.50
W4KYI	52.50
K5ADQ	19,630.00
W5EGD	13,230.00
W5KFC	10,813.75
W3YTM/5	8,531.25
K6OWQ	7,172.50
K6BUS	5,928.00
W6PCA	3,951.25
K6FNK	2,403.00
KN6RQB	·525.00
W6EHA	258.75
W6WSV	160.00
W7COX	9,840.00
W7PUV	3,240.00
W7PTX	855.00
W7DIF	105.00
W7FDE	31.25
W8SJF	13,211.00
W8UAP	· 7,990.00
W8OGY	3,682.50
W8SNB	2,932.50
W8KLZ	2,370.00
W8OTK	693.75
W9WZL	11,610.00
W9STR	1,960.00
W9ZXZ	1,522.50
W9USR	1,125.00
W9MYC	1,012.50
K0BYY/ W0HQH	11,073.00
W0IRJ	1,080.00
W7KEU/0*	
CR7LU	220.00
KL7ALZ	2,170.00
VE3AJR	14,535.00
VE3DMX	2,449.00
VE3DDA	50.00
VE5DZ	1,917.00
VE8EJ	2,015.00
KP4ZV	6,975.00

OM CW

W1BNS	1,312.50
W1AJZ	1,268.00
W1LQQ	500.00
W1DPB	385.00
W1LNM	60.00
W1VBR	7.50
W1LIG*	
W1WEE*	
K2DSW	1,755.00
K2KDW	1,586.25
W2NIY	940.00
W2EMW	935.00
K2DEM	807.50
K2GLQ	700.00
K2HXR	468.75
W2SAW	340.00
K2OPJ	337.50
W2LRO	260.00
W2DMU	221.00
K2GTC	220.00
W2BWW	195.25
K2PPV	150.00
W2LGK	60.00
K2UOY	44.00
K2OEG	37.50
W3ARK	1,625.00
W3ZHQ	1,410.00
W3MDO	1,222.00
W3FSP	875.00
W3CDG	562.50
W3GYP	412.50
W3EIS	385.00
W3JNP	367.50
W3MSR	341.25
W3EIW	233.75
W3WHK	187.50
W3QLW	120.00
W3CN	78.75
W3UDO*	
W3FKE*	
W4EJP	1,290.00
W4JUJ	945.00
W4WRH	918.75
W4ZQK	787.50
W4BAZ	431.25
K4ARP	393.75
K4DRO	350.00
W4WSF	300.00
W4VB	140.00
W5JD	693.00
W5AWT	588.00
K5CBA	67.00
W4SAS/5	60.00
W5LVM	16.00
W2JVN/5*	
K5HXB*	
W6JVA	1,430.00
W6DAC	1,053.00
K6OHM	350.00
K6MSG	187.50
W6CLZ	87.50
W6ZZ	25.00
W6BIL*	
W6DXZ*	
W7ECX	300.00
W7QLH	212.00
W8AQ	1,560.00
W8IBX	1,150.00
W8YGR	1,150.00
W8AJW	1,063.75
W8GEB	840.00
W8BDO	825.00
W8QHW	652.50
W8QXW	630.00
W8YPT	350.00
W8PGT	318.75
W8CSK	187.50
W8UPH	31.25
W9LNQ	1,250.00
W9CHD	866.25
W9QGR	836.00
K9DWG	800.00
W9FFQ	760.00
K9GQK	750.00
W9NDF	712.50
W9YDQ	665.00
W9RKP	600.00
W9DYG	412.50
K9EWB	234.00
W9JJN	165.00
W0GAX	900.00
W0YJM	875.00
W0ZZT	813.75
W0BLH	600.00
K0ARS	594.00
W0SGG	367.00
W0COK	336.00
W0YCA	265.00
DL1IB	25.00
DL1YA	9.00
EA1AB	64.00
F9DW	28.00
SM5AVV*	
VE2AQO	385.00
VE2AJD	20.00
VE3DYJ	357.00
VE3BNQ	206.00
VE6SX*	
VE7KX	1,462.50
CT1CO	56.00
LA6U*	
PA0LY*	
PA0VO	20.00

YL PHONE

W1SCS	45,225.00
W1RLQ	23,778.75
W1YYR	15,900.00
W1CEW	7,955.00
W1ZEN	4,318.75
W1YPT/1	2,616.25
K1ADY	656.25
W1VXC	325.00
W1YNI*	
K2JYZ	7,425.00
K2LTN	3,060.00
K2GVM	1,365.00
W3URU	28,670.00
W3CZP	23,085.00
W3VNN	20,900.00
W3MDJ	12,180.00
W3ZUF	2,968.00
W3WML	302.50
W3RXV*	
W4KYI	20,800.00
W4BQI	9,052.50
K4ETB	5,162.50
K4KKR	4,537.50
W4HLF*	
W5DRI	42,082.50
K5BNQ	39,675.00
W5SPV	24,060.00
W5HWX	19,211.00
W5JCY	6.858.00
W5WXT	5,187.50
K5CCJ	4,719.00
W5RYX*	
W5DYA*	
W6QGX	35,145.00
W6JZA	27,540.00
K6EXQ	16,560.00
K6VFE	3,570.00
W6EHA/M	2,405.00
K6KUP	2,070.00
K6OQD	1,280.00
W7DRU	10,455.00
W7FDE	787.50
W8NDS	15,180.00
W8VRH	525.00
W8OTK	315.00
W8KLZ	180.00
W8OGY	118.75
W9MPX	10,780.00
W9UON	7,215.00
W9VNG	5,655.00
K9CQF	5,206.25
K9AMD	375.00
K9DBD	180.00
K0BFS	27,951.25
K0BMS	16,905.00
W0NIQ	15,650.00
W0PSP	13,387.50
W0BFW	2,231.25
W0ZWL	1,950.00
K0BTV	1,125.00
W0EEE/ K0DEY*	
KL7BHE	26,320.00
KL7ALZ	18,470.00
KL7BJD	15,637.50
KP4ZV*	
KZ5VR	13,104.00
VE3DMX	12,781.25
VE3AJR	5,895.00
VE3DDA	150.00

OM PHONE

W1YWU	3,187.50
W1BNS	2.240.00
W1NEP	1,470.00
W1NLM	1,462.50
W1FYF	1,332.50
W1BCD	1,102.50
W1BAB	1,000.00
W1LQQ	975.00
W1VBR	131.25
W1FJJ	87.50
W1LIG*	
W1BTU*	
K2DFM	2,880.00
K2DSW	2,208.75
W2COB	1,050.00
W2MCO	540.00
K2OBO	255.00
K2KDW	210.00
W2DMU	112.00
K2OPJ	97.50
W2EFE	90.00
W2LGK	62.50
W2TUK	18.75
K2GBN	15.00
W2KYG*	
W3CMD	1,820.50
W3EDA	725.00
W3ZHQ	697.50
W3MDO	416.00
W3ZIH	384.00
W3CDG	375.00
W3EIW	100.00
W3BVL*	
W4JUJ	1,667.50
K4DRO	1,017.50
W4WRH/4	918.75
W4VD	840.00
K4ARP	725.00
W4JLK	393.75
W4EJP	367.50
W4VPO	192.50
W4WSF	123.75
K4CQA/4	52.50
W5LVM	2,886.00
K5CXK	1,820.00
K5CVI	1,237.50
W5CSY	1,092.50
W5GFX	162.50
W5PM	61.25
K5CBA	1.25
W6UTZ	2,531.25
W6FGJ	2,430.00
W6JVA	2,066.25
W6PAL	1,397.50
K6DAC	1,375.00
K6OHM	1,100.00
K6MPX	925.00
W6DXZ	525.00
W6DAC	510.00
W6ZZ	440.00
K6ICS	233.75

← Contest scores—

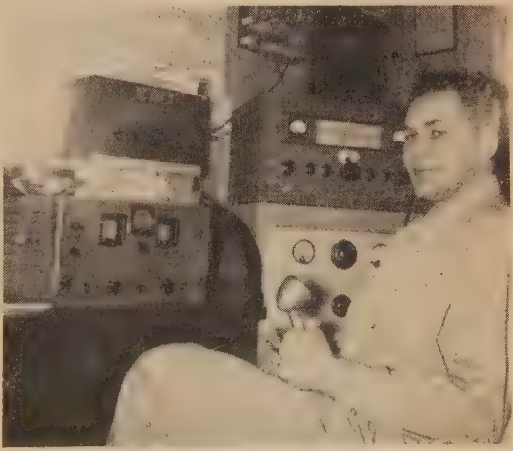
[*Continued on next page*]

Here are the top scores in all categories:

	YL CW	SCORE	AWARD
K5ADQ,	Nikki Boyd	19,630.00	Cup
W4HLF,	Arlie Hager	18,342.50	Cup
W1RLQ,	Grace Swenson	16,575.00	Certificate
	YL PHONE	**SCORE**	**AWARD**
W1SCS,	Ruthe Ferguson	45,225.00	Cup
W5DRI,	Dena Morgan	42,082.50	Cup
K5BNQ,	Doris Anderson	39,675.00	Certificate
	OM CW	**SCORE**	**AWARD**
K2DSW,	Robert Panek	1,755.00	Cup
W3ARK,	John Kupp	1,625.00	Cup
K2KDW,	Everett Oren	1,586.25	Certificate
	OM PHONE	**SCORE**	**AWARD**
W8AJW,	Jack Siringer	4,208.75	Cup
W7SFK,	Ray Woods	3,480.00	Cup
W1YWU,	Willam Cheney	3,187.50	Certificate

In addition to the awards mentioned above, certificates were mailed to YL and OM high scorers in each district (provided at least three logs were received from the district). W3YTM/5, Mildred, YLRL's VP who handled the contest, expresses the hope that next year more logs, or at least a postcard confirmation, will be turned in by more contest participants to be sure district winners receive certficates. Mildred reports logs indicated 375 YLs and over 1100 OMs participated in the contest. (Logs received—127 YL; 210 OM.) All States, all VE districts and 64 countries were represented.

Conditions were good and everybody had a good time. The one exception—a 13-yr. old OM whose voice had not yet found its proper range. His "CQ YL" brought instant response from a multitude of OMs and whenever he



W8AJW, Jack Siringer, winner among the OMs in the phone section of the 8th YL-OM Contest. Jack credits his success to an all-band transmitter and considerable effort.

Remainder of contest scores

W6QOZ*		W8AJW	4,208.75	W0ZZT	2,138.75
		W8UVD	1,500.00	W0WLT	1,485.00
W7SFK	3,480.00	W8CGQ	356.25	W0TOM	1,320.00
W7NPV	2,137.50	W8UON	356.25	W0YJM	1,282.50
W7KOI	1,375.00	W8UPH	337.50	W0GXP	1,008.00
W7AZI	945.00	W8QXW	294.00	W0BLH	630.00
W7ZLQ	208.00	W8AVW	49.00	W0YQR	425.00
W7CUV	178.75	W8JAX	20.00	W0JBM	385.00
W7BLN*				W0GAX	320.00
W7FZB*		W9CMC	2,596.25	W0MCX	260.00
		W9NLF	300.00	W0YCA	212.00
		W9QGR	91.00		
				DL1IB	280.00
				DL4XZ	196.00
				DL9XR	61.25
				F8PI	432.00
				LA8WE*	
				VE3APS*	
				PA0VB	31.00

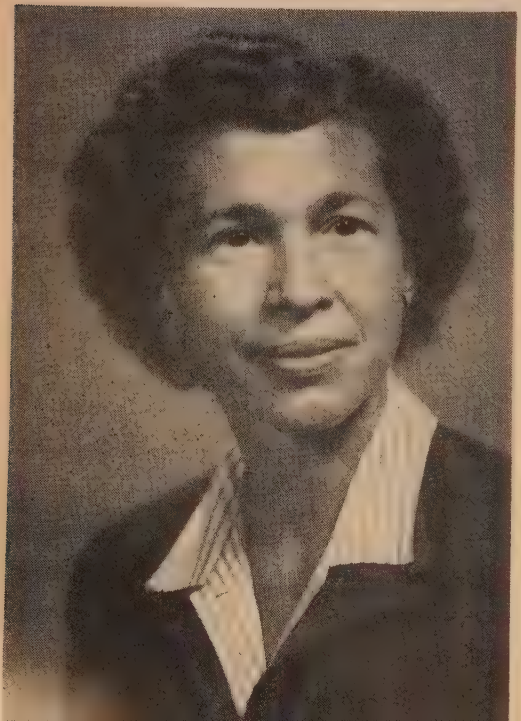
tried to answer a YL's CQ he was usually greeted with, "Will the other YL on the frequency stand by, please?" And "stand by" they meant. Better stick to cw next year, Johnny!

Here are the other scores. Highest score for the district is listed first. An asterisk (*) denotes log submitted for confirmation only.

W0ZWL Honored

In our enthusiasm to congratulate W3CUL, Mae Burke, for winning the 1956 Edison Award (CQ, April, page 86), we did not intend to neglect W0ZWL, Martha Shirley, who also was nominated for the Edison Award and received a special citation plaque. W0ZWL, who has been licensed since 1937, has always had "service" as her motto in Ham radio. She was active in AARS and in MARS, has earned the BPL medallion and six public service certificates, has served as assistant SCM of S.D. and since 1955 has conducted the South Dakota Weather Net. Her special citation was in connection with the weather net when she operated 24 hours during a two-day sleet storm in April '56 and for operating four days and three nights during a blizzard in November during which Martha, herself, was snowbound. For further details, see the photograph and story about Martha which appeared in this column in CQ for Feb. 1956, pages 85 and 116.

Endless are the reasons for getting a Ham license. W8FPT, Wava Harlan, got hers in 1950 "to save phone bills" while her OM, W8EAM, traveled. W8FPT is active on 10, 20 and 75 phone and also holds 20 wpm CPC. Daughter Jeanne is W8UVV.



With the Clubs

The YLs in the Dallas area have organized a club with the name "WHO"—Women Ham Operators. Officers are: president, W5WXY, Bernice; vice president, K5CRH, Marie; secretary, K5BNH, Bea; CD co-ordinator, W5SYL, Iva.

SPARCYLS of St. Petersburg, Fla., recently elected these new officers: president, W4BAV, Catherine; vice president, W4WPD, Shirley; secretary-treasurer, W4TDK, Naomi.

The "3 C's," YL club of Sacramento, Calif., is now circulating a monthly news sheet titled "'Chirps' from the Camellia Capitol." It is edited by club president K6ENK, Wanda. The club recently had an FB write-up in *The Sacramento Bee.*

YLs Meet

Nearly two dozen YLs gathered at the convention held in Grand Rapids, Mich., March 9. W8FJU and W8RIR, Beth, were co-chairmen of the YL meeting. W8ATB, Esther, told of plans for the May YL convention in Flint, and W9YWH, Evelyn, outlined activities for the 2nd National YL Convention to be held in Chicago Labor Day weekend. YLs attending: W8's REI, WQE, LIV, FJU, FPT, ONI, QOQ, SJF, KLZ, UAP, SNB, QPT, QOY, VRH, WDW, EIR, ATB, RIR; KN8's DJH, BXP; W9's YWH, NWI; W0ZTH.

Old Old Timer's Club

W1CPI, president of the Old Old Timer's Club, tells us that they are looking for women members for the OOTC. The club now numbers about 100 members. To qualify for membership one must be an amateur radio operator who holds a valid amateur license and who held a two-way contact over his or her own transmitter and did so make such transmission with some other wireless station, whether amateur, commercial or Naval, *at least forty years prior* to the date of his or her application. Applicant need not have been continuously active in the art during the intervening years. Applications for membership may be obtained from W1CPI or W4PPZ.

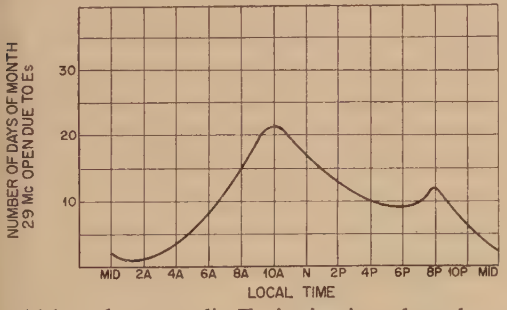
33 till next month—W5RZI

Propagation *[from page 77]*

Static levels and ionospheric absorption have both increased considerably since February and it is very unlikely that night time 160-meter propagation during June will greatly exceed a few hundred miles. W1BB does point out however that if one is patient enough to wait for that "quiet night," 160-meter DX can be worked even during the summer months . . . and he has a QSO with South Africa to prove it.

Sporadic-E

There frequently forms within the normal E-layer region of the ionosphere, "clouds" or "patches" of abnormally dense ionization, which are capable of reflecting radio waves of frequencies much higher than those reflected by any of the regular layers. These clouds usually take the form of thinly ionized areas covering a rather small geographical region. They occur more or less at random and are relatively short lived. Because of the intermittent nature of this sort of ionization in the E-region it is usually referred to as *sporadic-E* ionization. Sporadic-E ionization is capable of reflecting radio waves, at oblique incidence, on frequencies exceeding 30 Mc, and on remote occasions transmissions as high as a 150 Mc have been reflected by intensely ionized sporadic-E clouds. Exceptionally long distance propagation does not often occur by way of sporadic-E because of the remote possibility of the clouds being present over such a large area necessary for multihop propagation. Occasionally two-hop sporadic-E propagation will occur for distances up to about 2400 miles, and from time to time the combination of regular F-2 layer reflection and sporadic-E reflection will result in communication being possible over long distances during periods of time when F-2 regular propagation alone could not be possible. For the most part however, the geometry of sporadic-E propagation limits range to one-hop distances not usually exceeding 1400 miles. For this reason it is often referred to as "short-skip" propagation. (*See Figure 3*).



Although sporadic-E ionization has been studied by scientists and engineers for nearly thirty years, its nature and origin still remain largely a mystery. However the following general characteristics of sporadic-E propagation have been discerned:

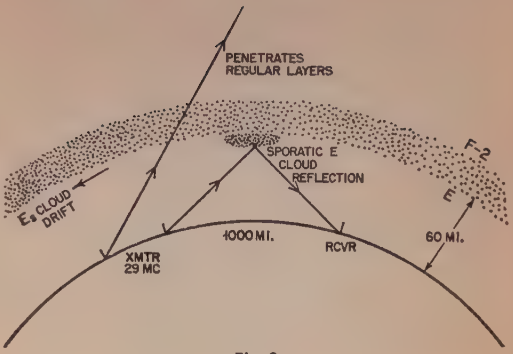
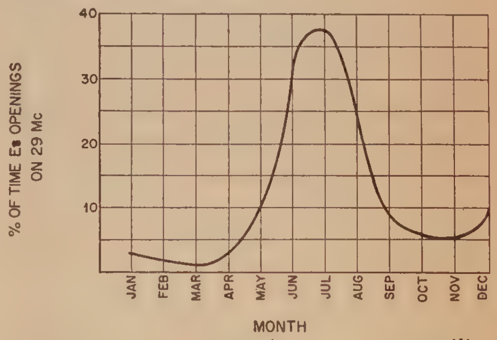


Fig 3

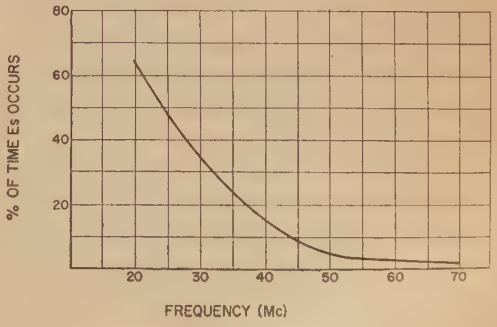
The occurrence of sporadic-E ionization varies geographically. It occurs most frequently, and with greatest intensity, in northern latitudes in the vicinity of the auroral zones, and in equatorial regions. In mid-latitudes, for example in the United States and most of Europe, sporadic-E occurs often during the summer months (*see Figure 4*) but hardly at all during other seasons. In mid-latitudes, sporadic-E has a tendency to peak in occurrence during the daytime hours, (*see Figure 5*), and is minimum at night.

Sporadic-E ionization is rather unstable. The ionized clouds are known to drift, generally in a westerly direction, at rates of approximately 150 to 250 miles per hour. The drift appears to be due to winds believed to exist in the ionosphere. Because of drift, reception areas can change within relatively short periods of time, and it is not uncommon for a sporadic-E

[Continued on page 116]



◄ Fig 5 Fig 4 ▲ Fig 6 ▼



DX

R. C. "Dick" Spenceley, KV4AA
Box 403, St. Thomas,
Virgin Islands

Our heartiest congratulations go to the following station upon his achievement of WAZ!

No. 344 CX2C0 RICARDO SIERRA 40-232

Ricardo is the second Uruguayan WAZ and lacks only Zone 19 QSL for phone WAZ.

We also welcome the following as newcomers to the HONOR ROLL:

CW/Phone			W3RPG	Bill	36-136
W6ZEN	Floyd	39-206	W9BEK	George	36-111
W0BCI	Herb	39-187	W9DFV	Larry	36-110
W8CWY	John	38-163	W5PM	Jack	36-106
K2KCE	Bill	38-152	W2QKJ	Chas	35-168
W6TKX	Dick	38-147	W1WAI	Dave	35-156
W8OYP	Nick	38-145	K2CF	Glenn	35-146
W9OTS	Elmer	38-144	K4EHA	Phil	35-115
W6EYY	Hal	38-136	KL7BUZ	Dave	35-113
DL4RI	Norm	37-137	PHONE ONLY		
G4TM	Tom	37-130	CX2CO	Rick	39-222
W9QNO	Russ	37-105	GC6FQ	Peter	35-161
W4TFB	Don	36-174	W4TFB	Don	35-144
VE3HB	Hal	36-147	W6CHY	Gan	35-134

GRAND CAYMAN ISLAND, VP5BH: (Via W4KVX and OVARA "Ether Waves") We were on the air from Grand Cayman from 1900 EST, March 20th, to 1200 EST, March 27th, or about 160 hours (24 hours per day). About 45 hours of this time was spend on phone with about 5 hours being on sideband. Hallicrafters loaned us a brand new SX-101 receiver and HT-32 transmitter for the trip. We had two tri-band cubical quads with us donated by Skylane, of Tampa, Fla., and Tele-Tronics of Ambler, Pa. The Skylane was erected first because of its lightness but it crashed in a high wind on the third day of operations and was pretty well wrecked. Both beams were excellent for the three bands and performed beautifully. A beam rotator (TV type) was donated to us by United Radio of Covington, Ky. and was used throughout. An all band vertical, donated by the World Radio Labs was used on 40 meters but was also damaged in the wind. Doublets for 40 and 80 performed reasonably well. All antennas were left at Cayman for "Sparky" Hanlan, VP5BH himself, to use when he can get some additional equipment. Contacts, during the seven day operation, numbered about 4100. About 2500 of these were made during the period covered by the second half of the CW contest. At a guess, 700 QSO's were on phone which include about 200 on Sideband.

The first ten contacts on phone were: W8RNB, W5TIZ and W5HJA on SB. W2BCS, W1GAC, W9RBI and W5ZBZ were then worked on AM. W8FGX was then worked on 7 Mc SB and W8SDD and W8MDO followed on 21 Mc AM.

The first ten contacts on CW were: W8FGX, W4EPA, W4JBQ, W8BRA, W8BTI, W8BOJ, W8JJW (all fellow club members and not planned!), W6YMD, W6CTL and W0DSP all on 14 Mc.

Country total was 55 phone/CW and about 30 on phone. "Firsts" in each W district on phone were: W1GAC, W2BCS, W3OMY, W4LPW, W5TIZ, W6EII, W7MQY, W8RNB, W9RBI and W0SFC. "Firsts" in each W district for CW were: W1YNP, W2MUM, W3-DAO, W4EPA, W5LRY, W6YMD, W7AC W8FGX, W9KXK and W0DSP.

First VE contacts were VE1ZZ on CW and VE7MS on phone.

First European contacts were G8JR on CW and G3BNC on phone.

First Asian contacts were JA8AA on CW and 4X4FF on phone.

First African contacts were CN8JZ on CW and ZS6OV on phone.

First South American contacts were PY7DQ on CW and HC1FN on phone.

First Oceania contacts were ZL2AFZ on CW and VK5MS on phone.

Finally, we consider the expedition was a tremendous success (right—ed.). We did abou everything we set out to do altho there was precious little time left over from ham radio for the other attractions of the island. We were treated like royalty by the islanders and couldn't have been more comfortable. "Sparky" Hanlan contributed much to our success be

This somewhat desperate character, known to have raised havoc in DX circles, was finally captured by the Cincinnati Police Department. He admits having gone under several aliases, such as FO8AN, VR1B, VK9TW and VR4AA. He talked freely saying "YASME and I'll tell ya—ya clot" (ouch), and threatens to escape and resume his nefarious trade using such aliases as Kermadec Dan, FW8, VR5, CR10, VU5, etc. He sees no reason to mend his ways but promises to steer clear of reef(ers)! (Photo W8JIN)

sides loaning us the use of his call. He filled in, at the key, during our most exhausted moments, especially those around dawn each day and frequently in the late afternoons. As a matter of fact Sparky was often the life of the party—A Gloystein of the B.W.I. and how we could have managed without him is difficult to say. His "We must, mawn, we must!" became a sort of catch-word for us.

Plans are already under way for next year's DX-pedition, we are so enthused. We have two or three excellent DX locations in prospect. one of which, if it works out, will give everyone a new country (wonder where that can be?). Another, Navassa Island, was our first choice this year but had to be discarded because of the excessively high costs of boat transportation from Miami. Contacts made in the Caymans, however, which would make a Navassa venture quite feasible next Winter if other DX'ers don't get there ahead of us.

DX Notes

Rundy, W3ZA (ex-KV4AD), passed through KV4-land in early April on his way to Viet-Nam for a two year stay. He was due to arrive there on April 16th. If licensing obstacles are overcome (FCC ban etc.) Rundy will be very much in evidence with an Eldico KW on CW and SSB. He will attempt to get an XV call rather than 3W8, which is now used in communist Viet-Nam, and will also definitely get on the air from Cambodia, XU, whose border is only about 50 miles from Saigon . . . EA9DF was due to make his monthly trip to IFNI on April 15th. As we heard no reports from him it is probably due to the non-arrival of the SSB-100A. He will undoubtedly receive this rig in time for his May trip . . . ZA1AA has been quite active of late giving his name as Toni and QTH: Box 28, Kcrag, Albania. His QSO No. 2000 was with KV4AA which gives us hopes that he may be on the up and up. . . . The TI2 DXpedition to Cocos Island, signing TI9CR, was heard on April 1st. Apparently their stay was cut a bit short as nothing was heard from them after April 3rd. QSL via TI Bureau . . . LA1VC/G is due on from Antarctica . . . W4DQA/KS4, Swan Island, was heard on 21350 phone. He runs 40 watts . . . KP4JE and KP4KD plan a trip to the British Virgin Islands around July 1st. The call VP2-VG may be used . . . For WPX KN8BIT reports WB6BE, a novice on Canton Island, worked on 21160. QTH Box 1 . . . HB9FU was due to be in Liechtenstein on April 7th and 8th signing HB9FU/FL on 14303 SB . . . CR10AA is active again with new rig and has been heard from 0900 to 1500 GMT on 14030 and 14054 . . . Ghana has been embellished by the activity of ZD4BQ heard on 14062 around 2230 GMT . . . G3FYR/VS9 continues activity from Aden on 14 and 21. We understand that he will obtain the call of VS9AI. There is no confirmation of reports that he has operated from the Maldive Islands . . . JZ0PA is on the air again after rewinding his power and modulation transformers and overcoming: 1.—A severe case of malaria. 2.—Tropical ulcers. 3.—Crushed ribs. 4.—A fire which wrecked his transmitter. Ham radio will prevail! QSL's go via VK6MK . . . FO8-AP/MM, the raft Tahiti-Nu, sails on. The position given April 15th was 34/06 South and 105/20 West. He seeks CE contacts . . . K6-ENL reports HL2AJ heard on 14180, A3, at 0915 GMT while OM Clay, W6LGD, heard HL2AC on CW about same hour . . . The XF1A, much in evidence during the recent DX contest when he made over 3500 contacts and over a million points is of course, XE1A. Same QTH . . . FW8AA, Wallis Island, may be found near 14340, 0600 to 0900 GMT. Sometimes CW, sometimes "Il parle francais" . . . W6YY informs us that ZC5DA

W1YNP, Bob DeBragga, Stonington, Conn. came on in 1955. He already holds several awards and is up to 136 countries.

is active on 14 CW from British North Borneo, also ZC5AL. The latter is usually on 14066 . . . VQ6LQ has solved the strange disappearances of FL8AB from time to time. Seems that Guy is a marine radio operator and has to dash to sea occasionally to gather in some francs . . . W0IUB advises that W9KLD/KL7 is operating north of the arctic circle. Such a contact is needed as part of the KL7 award . . . HK3AB still plans operation from HK0, San Andres, and will inform us when QRV . . . DL7AH still arranges skeds for those needing OY7ML. Time 0730 GMT . . . From the South Calif. DX Bulletin we have what may be future KS6 activity in excerpts from a letter to W6-OUN from Tom McGue, Chief Radio Officer of the SS Mariposa——"The U.S. Navy moved from the island (American Samoa) several years ago and there are no military personnel there at present. There are, however, a number of American Technicians, specialists etc., employed under contract by the Interior Department. One of these men is the communications chief with whom you may be interested in contacting. Will pass your letter to him on arrival at the island April 27th"——. . . W6-CYV advises that HC8GI is sending out long awaited QSL. Same for YK1DF. Chile is building a big airfield on Easter Island to serve the air route to Australia. Net result, we hope, more CE0's . . . Ray, ex-VR3A, now VK2-AMB, has new assignment in VR2-land. He should be there in May . . . HB9MX and HB9-UE plan many weekends in HE-land this summer. 14, 21 and 28 Mc. phone and CW will be used . . . W2QHH returns QSL's for SV0-WN to senders. No logs, letters or cooperation from the SV0! . . . HR1LW closed down and returned to W3-land . . . HS1WR active around 1500/1600 GMT, 14098, T9C. QTH in book (see QTH's) . . . Barrie, ZD9AE, was due to leave Gough Island in May. He will be missed . . . Active KC4 stations have been reported as follows: KC4USA—Little America, KC4-USB—Marie Byrd Land, KC4USH—Cape Adare, KC4USN—Geographical South Pole, KC4USV—McMurdo Sound . . . Ralph, VP8-AO, is located at the Shackleton Base, Antarctica. QSL's go to: VP8AO, 34 Lynwood Ave., Luton, Beds., England . . . VP8CI is located at the Royal Society base, Halley Bay, Antarctica. QSL to: Royal Society Antarctic Expedition, London . . . If a station signing "OYD" is heard it is a French expedition to Greenland which has permission to use the amateur bands . . . YI3AA has been heard on 14080 and YI2DX on 14082, 1930 GMT . . . An SSB station was expected to be on the air from Ascension Island, ZD8, commencing about the last part of April . . . VR2AA has returned to New Zealand and can supply missing VR2-AA QSL's. Contact ZL bureau . . . ZE6JB and ZE5JT are active on SSB. ZE2JE is active on 50 Mcs. and has made several W contacts on that band . . .

Addresses

AP2AD—Box 4074, Karachi, Pakistan. (Corrected)
CE0AC—Box 1234, Santiago, Chile. (Eas Island)
DL4PR—Vic Bridport, RAF, 6911 RG APO 175, PM., N. Y.
ex-DL4PR—(QRT une 1956) Via W3A
FB8CC—Pierre, FB8 Bureau, Box 587, T anarive, Madagascar.
FQ8AP—Serge Canivenc, Box 793, Bang Oubangi-Chari, F.E.A.
ex-HA5KBA—Via W3AXT or, Andrew Bo onyi, 530 45th St., Union City, N. J.
HH2DX—Via W0GDH.
HI8BE—Burke Edwards, American Embass Ciudad Trujillo, D.R.
HS1A—Via W6FKH.
HS1MQ—(LU8DB) Lucho, 47 Jawarad Roa Bangkok, Thailand.
HS1WR—Kamchai Chotikul, Artillery Cente Lop Buri, Thailand.
I1ZCN—Box 511, Firenze, Italy.
JZ0PC—Via VK5AB.
KG1CA—(W3ZHL) Luke Rogers, 3306 Ca uga Ave., Altoona, Pa.
LX2GH—Via DJ2PQ.
MP4BBA—Box 29, Maharraq, Bahrein (Questionable)
OD5BZ—Box 2806, Bierut, Lebanon.
PY8HJ—P. O. Box 174, Manaus, Amazona Brazil.
SV0WD—(Crete) Willis T. Bird, Box 15 Sanford, Fla.
SV0WJ—John D. Britto, American Cons late, Salonika, Greece.
SV0WP—(W3JTC) Larry Eisler, JUSMAG USASG, APO 206, PM, N. Y.
TI9CR—Box 2412, San Jose, Costa Rica.
VK0AB—Via VK2EG, Bill Storer, Lot 1 Prince Charles St., French Forrest, Sydne Australia.
VK9AJ—Les Lerpinier, Direction Islan Cocos-Keeling, Via Perth, Australia.
VP1RL—Box 267, Belize, British Hondura
VP2VG—(QSO's between March 7th an 12th) Via KV4BB.
VP5BH—(QSO's between March 20 an 27th) Via W4KVX.
VP5DS—(Turks Island) Via K4HOI.
VR3B—Dean Law, 102 Darling Road, Ea Malvern, Melbourne, Australia. (Fannin Island)
VS9AG—Via W2ZGB.
W2CUQ—(New) Will Irwin, 33 Lakevie Terr., Grasmere, S. I., N. Y.
XF1A—Via XE1A (Same QTH)
ZA1AB—Box 42, Tirana, Albania.
ZA1AA—Toni, Box 28, Kcrag, Albania.
ZA1KUN—Box 55, Tirana, Albania.
ZB2V—R. Hartland, Room C-8, RAF, Ne Camp, Gibraltar.
ZC4JX—Box 216, Famagusta, Cyprus.
ZC5VN—F/LT. V. H. Norrish, RAAF, L buan, Br. North Borneo.

D4BF—Dr. J. R. S. Innes, P. O. Box 36,
Nsuta/Wassaw, Ghana, West Africa.
-ZS7H—Via G. Smit, ZS6ALZ. 1 Base Sig-
nal Workshops, P. O. TEK, Transvaal, Union
of South Africa.
V8AO—Box 303, Tunis, Tunisia.

Thanks to W0RAP, W6YY, G4CP, K4DAS,
V0CDV, W6KG, W8KML, Willamette Bul-
tin, W3AXT, W2PTD and West Gulf Bul-
tin.

Honor Roll Endorsements

o April 15th, 1957)

2GX	40-270	W3DKT	39-227	W4HKJ	36-158
V4AA	40-268	W2GVZ	39-222	W1RAN	36-157
9VND	40-267	W9UXO	39-219	VE3HB	36-147
6SAI	40-265	W6ZEN	39-206	W3UXX	36-146
6GFE	40-260	W6LGD	40-208	W3RPG	36-136
6TI	40-258	W9LI	39-193	W9BEK	36-111
6NTR	40-251	W5HDS	39-190	W9DFV	36-110
8KML	40-244	W4NBV	39-189	W5PM	36-106
8SYC	40-244	W0BCI	39-187	W2QKJ	35-168
X2CO	40-232	VE6MN	39-173	W1WAI	35-156
3DO	40-230	VK3YL	39-172	K2CF	35-146
8SDR	40-224	KP4CC	38-221	K4EHA	35-115
0NTA	40-211	W8QJR	38-218	KL7BUZ	35-113
6RLN	40-211	K6ENL	38-164	PHONE ONLY	
6LGD	40-208	W8CWY	38-163	CX2CO	39-222
6ID	40-201	K2KCE	38-152	W8KML	39-220
6BIL	40-200	W6TKX	38-147	ZL1HY	39-163
1CLX	39-260	W8OYP	38-145	W8QJR	38-217
3EPV	39-256	W9OTS	38-144	G3DO	37-205
1BIH	39-254	W6EYY	38-136	W4HA	36-214
2HMJ	39-246	DL4RI	37-137	W8SDR	36-172
4GG	39-242	ZL3CP	37-133	GC6FQ	35-161
1HA	39-241	G4TM	37-130	W4TFB	35-144
4HA	39-239	K6CWS	37-129	W6CHY	35-134
4EPA	39-236	W9QNO	37-105		
0QVZ	39-230	W4TFB	36-174		

st complete HONOR ROLL appeared in the May issue.
ext complete HONOR ROLL will appear in the September issue.

WAZ TOP FIFTY

6AM	274	W6VE	263	W8BRA	251
1FH	273	PY2CK	262	W6NTR	251
6AOA	270	W6VFR	261	VK2DI	250
6MX	270	W9NDA	261	GM3DHD	250
2GX	270	W6ADP	260	W8NBK	249
6ENV	269	W8BHW	260	W1GKK	248
6SYG	268	W6GFE	260	W6NNV	248
V4AA	268	W6MEK	259	KH6IJ	248
2AGW	267	W3EVW	259	250 PLUS	
3KT	267	W2BXA	258	W5ASG	39-269
8JIN	267	W6EBG	258	W1CLX	39-260
9VND	267	W6TS	258	W9RBI	39-259
8KIA	266	W6TI	258	W3EPV	39-256
6DZZ	265	G6ZO	256	W2WZ	39-255
3GHD	265	W5KUC	256	W5ADZ	39-254
8PQQ	265	W9HUZ	256	W1BIH	39-254
6SAI	265	W7AMX	255	W9LNM	39-252
7VY	264	W7GUV	255	W8UAS	39-251
3JNN	263	W0YXO	252	W2QHH	39-251
6SN	263	CE3AG	252	W8JBI	39-250
6CUQ	263	W8HGW	251		

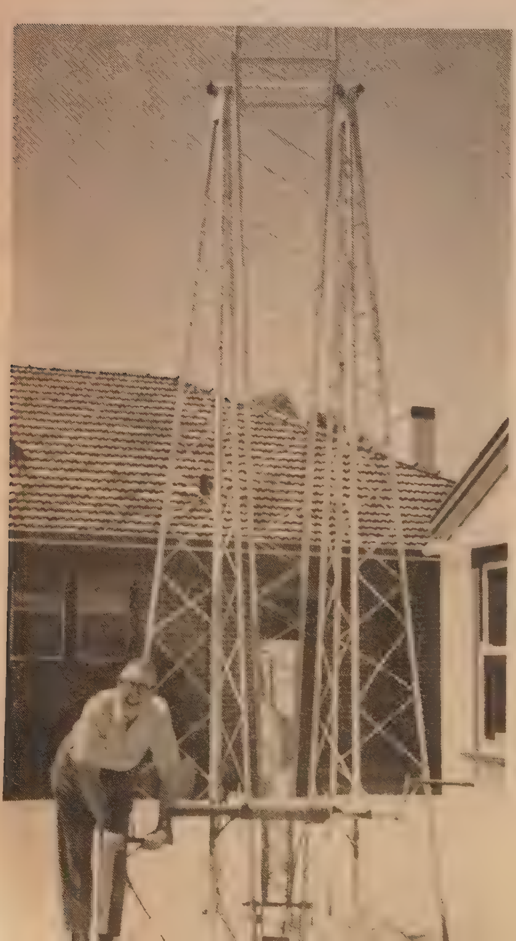
WAZ AND 200 PLUS PHONE

Y2CK	40-244	XE1AC	39-217	G3DO	37-205
Q4ERR	40-241	W3LTU	39-206	W3KT	37-203
/6AM	40-221	W9NDA	38-225	W1NWO	36-225
8IG	40-199	W8QJR	38-217	W1MCW	36-223
6ITH	40-161	CE3AB	38-214	W4HA	36-214
9RBI	39-240	W2BXA	38-211	W5ASG	36-205
/6DI	39-233	W3GHD	38-209	CO2BL	35-210
X2CO	39-222	W6KQY	38-207		
8KML	39-220	W3JNN	37-234		

DXploits

Jock, ZL2GX, leads off this month with an
nposing 270 after contacts with OH2AA/0,
A1KUN, VP2VE and ZD8SC . . . Dick,
V4AA, added ZA1AA and ZD4BF (Ghana)
or 268 while Ozzie, W9VND, nabbed VP2VG,
R01AA, SV0WD and UM8KAA for 267
. . Bill, W6SAI, jumped from 257 to 265
anks to IT1TAI, OQ0DZ, VP2VG, OH2-
VI/0, CR5SP, UP2KBC, ZC3AC and PX1EX
s Homer, W6GFE, hit 260 with VP2VG, UM8KAA, OH2AA/0, FR7ZC, EA0AC, IT1AGA, UO5KBR, OQ5DZ and ZC3AC . . . Horace, W6TI, now rests on 258 after keying with SV5LP (Rhodes), OH1ST/0, IT1AGA and CR5SP. While Jack, W6NTR, rose to 251 with VP2VG, CR10AA and HS1WR . . . Fred, W8KML, pushed his CW total to 244 and phone total to 220 with VP2VG, ZC5AL, ZD4CB and SV0WD as Clint, W8SYC, also hit 244 with OH1RT/0 and LA8FZ/P . . . G3DO, Doug, went to 230 and 205 (phone) with YA1AM while Murel, W8SDR, upped to 224 and 172 (phone) thanks to VK1RW, SM8KV/LA/P and VP2VG . . . Leo, W0NTA, keyed with EA0AB, VP2VG, YA1AM, FP8AP and CE0AC for 211 as Casey, W6RLN, made it 211 with VP2VG and VQ6LQ . . . Clay, W6LGD, hit 208 with VP2VG, KT1DM, ZC4JX, OH2WI/0 and UO5AA while Vaughn, W6ID, nipped UF6KAF, YA1AM, UI8AG and UL7KBA for a 201 total . . . George, W6BIL, hit an even double-century with FQ8AY, VP2LU, CR5SP, VP2VG, EA9AP, VQ6LQ and OY1R as Stan, W1CLX, pushed to 260 in the 39 zone column with VK9TW, OQ0DZ, IT1BXX and VP2VG . . . Bob, W3EPV, hit 256 with OH1NK/0, VP2VG, ZD8JP and VK9AJ while John, W1BIH, goes to 254 thanks to YA1AM, OH1RT/0, VP2VG, MP4KAC and ZC5RF . . . Gus, W2HMJ, who currently has about 350 towards WPX, upped to 246 with VP2VG, FR7ZC, MP4BBE and SV0WD as Byron, W4GG, hits 242 with OH2AA/0, FL8AB and VP2VG . . . Bill, W1HA, submits new list with a 241 total while John, W4HA, ups to 239 CW and 214 phone with OH2AA/0, VP2VG, UD6DD, UG6AB and UJ8KAA . . . Rip, W4EPA, keyed with ZS9G, KC6SP, FR7ZC, UH8KAA, VP5BH, ZC5AL, SV0WD and VP2VG to reach 236 as Bob, W0QVZ, makes it 230 with ZS9G, VP2VG, OH2AA/0, ZC5JM and UO5KPM . . . Chas, W3DKT adds five for 227 while Pat, W2GVZ, rises to 222 with ZD4BQ and UH8KAA . . . Frank, W9UXO, snagged VP5BH, CR9AH, TI9CR and ZC5JM thus moving to 219 as Jim, W9LI, keyed with IT1TAI, PJ2ME, 3A2BH, VP2VG, ZC4IP, VQ8AB, OD5LX, ZD4BQ and 15RAM to reach 193 . . . Tom, W5HDS, hooked VP2VG, UR2AR, UC2CB, ZC5AL, UI8KAA, IT1AGA, VS2DW, CR9AH and VP8BL for 190 while Carl, W4NBV, rose to 189 with MP4BBA and UJ8KAA . . . Merle, VE6MN, hit 173 with such as LU3ZS, YA1AM, ZC5GL, 3V8AO, VQ6LQ, XZ2AO, FR7ZC and FQ8AF as Austine, VK3YL, added a zone and country with UI8KAA for 39-172 . . . Juan, KP4CC, upped to 221 with VP2VG and ZC5AL while Frank, W8QJR, made it 218, 217 on phone, with ZD4CB, FE8AE, YA1AM and UL7CB . . . Aleta, K6ENL, pushed to 164 with VQ6LQ, OD5LX, VP2VG, IT1AGA, CP1CJ, CN2AQ, VP5BH and G3FYR/VS9 as Chas, ZL3CP, went to 133 with IT1AQS, TF3KA,

VK3JK, Jim Herd, Wangaratta, Australia sports a real nifty 70 foot tilt-over tower which is capped by a home-made G4ZU beam.



VQ6LQ and 9S4AZ . . . Hal, K6CWS, goe to 129 with such as YI2RM, VS4JT, VK9AT 3V8FA, VP4TM, UQ2AS, ZS3F and VP8CI as Bill, W4HKJ, adds 15 for a 158 total . . Ned, W1RAN, ups to 157 with VS1CW, VQ8AY and IT1AGA while John, W3UXX, hit 146 with UC2KAB and VQ6LQ . . . Dave ZL1HY, has 163 on phone thanks to UA0KQB . . . W2CVW, Ed, added ZC4IP, UA3CT, TF3KG, VP5BH, HH3DL and KG1FA . . . Tom, K4DRO, heads for WPX awarc with 64 prefixes up to April. Latest DX wa TF3KG, CP1CJ, OZ2N, 4X4IB, CT1PK VP2KD, GI8DV, EA8BO and FY7YF . . Lou, W8WBV, has 52 worked with KV4AA PJ2ME, UA4AF, HA5BI, VQ2GW and VP3AD . . . Jim, W9WHF, has 131, 177 confirmed his first 63 countries were worked with 35 watts to an 807 . . . New DX at K4CTU, on 28 Mc includes VQ3ES, VQ5GC, HE9LAA . . . Lloyd, W6KG, submits March activity as follows: 3.5 CW, KH6AYG, KL7AIZ and JA3BB. 7 Mc. CW: VP7NM and OA4FT. 14 CW: UA4IF, 4X4IF, HA5AL, UC2KAB, CR6AI, OQ5GU, SP1KAA, ZB1CY, 9S4CM, ZB2I. EA6AF, VS2DW, VS1GX, LX1FL and ZC4IP. 21 Mc. CW: ZS6DL, EI9J, OK1KDR CX2FD, UA0KKB, CE3ZO and HB9GX. 27 Mc. CW: KL7AIZ, VP2LU, KH6PM, CO2JK and ZL1MQ. 28 Mc. CW: FK8AL, ZS2HI VQ2GW, ZE5JA, OK3DG, OE3ED, YS1AA and IT1TAI . . . Clark, K4IIC, rises to 71 with such as VS6DO, VK9XK, 4X4BX, CT3AB FF8AJ, CR6AI, PJ2AN, EA9AP, VQ2GW KW6CA and YU3FK. All on 21 or 7 Mcs . . . Jon, W8GKB, nabbed VU2RM on 21023 1745 GMT, March 25th . . . Ted, G2HKU added CR6AI for No. 133 . . . Carl, W1BFT reports 315 towards WPX with 58 confirmec . . . W4TAJ added VQ5GC, VP5BH anc LU2ZS . . . W2HQL has 333 towards WPX . . . W1LQQ went to 131 with VP5BH anc FK8AL . . . W8IXM made WAC in 4 hour recently after ND for 24 years! . . . W3UXX worked 81 for WPX between Jan. 1st anc Mar. 25th . . . KA2NY received WAVKCA Certificate . . .

Addresses

CR4AH—Nuno, Aeroporto dos Espargos, Sal, Cap Verde Islands.
DJ0AA—Via G2DHV.
EL12A—W9GTX, Gene Fobes, 2714 Coolidge St., Madi son 4, Wis.
FG7XD—Gaydu Serge, 31 Rue Jeanne D'Arc, Grand bourg, Ile Marie Galente, Guadaloupe, F.W.I. (P.C Box 27).
HI8WL—Bill, Radio HI8WL, Cuidad Trujillo, D.R.
IT1TAI—Via W0BPA.
JZ0ACK—Via VK5AB or Eman Walsh, Naval P.O. Bia Is. Dutch New Guinea.
ex-KA2SK—W3ZGG/2, Stan Kasper, 609 Eighth St Riverside, N. J.
KA5ZS—(W6UWL) Capt. Z. E. Sprague, USMC. H&MS-1 MAG-12, 1st MAW, FPO, San Francisco, Calif.

L7BUZ—Dave, Hq. Sqdn. 10th Air Div. Det #1, APO 942, Seattle, Wash.
W6CB—George, c/o C.A.A. Wake Island.
D5LJ—Edward Jabre, Dbayeh, Lebanon.
Q0VN—Jan Van Meer, P.O. Box 9, Usumbura, Ruanda-Urundi.
J2ME—Via W2CGJ, Fred De Jaager, 211 Doremus Ave., Ridgewood, N. J.
U1AS—P.O. Box 2034, Cairo, Egypt.
U1IM—Ibrahim Mohamed, 27 Mohamed Farid Str., Abdin, Cairo, Egypt.
U1KH—Mohamed Ahmed Rashed, 80 Railroad Stn. St., Zeitun, Cairo, Egypt.
V0WJ—P.O. Box 134, Salonika, Greece.
I2GC—Gonzalo Calderon E. c/o C.M.A. Culver, Ind.
A0KTT—(Tannu Tuva) Box 27, Stalino, Ukraine, USSR.
B5WF Vladimir Goncharski, P.O. Box 41, Lvov, Ukraine, USSR.
P2KBC—P.O. Box 231, Kaunas, Lithuania, USSR.
Q2AN—Bruno Greiza, P.O. Box 1601, Riga, Latvia, USSR.
x-VE7ASL/VR3/VR3D—C. H. Freeman, 99-139E Heen Way, Aiea, Hawaii.
x-VP7NG—Glenn, KP4AGR, Box 386, Mayaguez, Puerto Rico.
x-VR2CG—Wyn McGee, 112 Hei Hei Road, Hornby, Christchurch, New Zealand (ZL3DX).
E1A—Juan Lobo y Lobo, Rodriguez Saro 308, Mexico 12, D.F. Mexico.
I3AC—Ron, Cable and Wireless Co. Baghdad, Iraq.
S1DM—No. 33 Calle Oriente, bis No. 520, Colonia la Rabida, Salvador, C.A.
A1AB—Via Postbox 88, Moscow, USSR.
C3AC—V. E. Mathew, Christmas Island, Care of GPO, Singapore.
S6TV—(New) A. R. Howard, Post Office White River, Eastern Transvaal.
S8I—P.O. Box 35, Leribe, Basutoland.
S9O—Box 23, Francistown, Bechuanaland.
S9P—Norman, P.O. Box 35, Francistown, Bechuanaland.
S7GE—3 Poinsetta Ave., R.N. Yard, Trincomalee, Ceylon.
S7LJ—c/o Fleet Post Office, Trincomalee, Ceylon.
S7PT—(Home) 160 Ladbroke Grove, London W-10, England. (QRT Dec. 1st).
A2FB—Fort Leclerc, Sebba au Fezzan, Libya.

Thanks to the West Gulf Bulletin, W6YY, W8TLL, W2GBX, VK5AB, W6ITH, W6RV, F7BL, SU1IC, K2DCA, W2HQL, W1ODW, W2OGE and W9RKE.

Last Minute News

Bob, W2AYJ, has the logs of FF8AJ and will handle all QSL's, past, present and future . . . G3HCL reports HS1B's QTH as Box 1038, Bangkok, Thailand . . . DL4AAP (W6GHM) may be reached as follows: Steward Fason, 18 Bergrhienfelderstr., Schweinfurt, Germany. Stew plans to go to M1-land in July . . . W4ML advises that UA0KYS and UA0PM are presently in Turan, Tannu Tuva (4/28/57) and UA9DN is fixing a sked for him (Don't know if this is a permanent set-up or not) . . . Don, K2AAA, reports another aerial jaunt was scheduled from May 10th to 25th covering such spots as Martinique, St. Lucia, Brazil, Ascension Island and Liberia. This was a USAF trip and most activity was planned on 21 Mcs sideband . . . W6GBG left DL4-land on April 19th for Turkey. The call TA3SJ has been assigned him and he should have been heard from by now . . . W1CKU worked one ZD0AA on 14008 who gave QTH as Mafia Island (South of VQ1) and said: QSL via ARRL. If this is any good it seems that a VQ7 or VQ0 call would have been more appropriate! . . . All QSL's for contact with KG1KK, after February 11th, should go via W3NNK . . . On April 22nd the raft "Tahiti Nui" gave position as: 34/18 S. Lat. 102/42 W. Long. . . . Louis, G5RV, was worked as G5RV/PJ2 recently. He has passed his PJ2 exam and will get a PJ2 call. Louis does considerable traveling and may also be heard as VP4RV, VP5RV, VP6RV and VP7RV. All QSL's go via Box 3443, Caracas, Venezuela . . . Joe, K5CAW, leaves in July for a year's stay in the Marshall Islands. He will sign KX6BP. Joe is ex-W3MTQ . . . W2IWC reports skeds between VR6TC and W6JHB on A3. We understand that W6JHB will forward a new receiver to Tom, VR6TC . . . W4GXB reports that W4DQA/KS4 has made over 500 QSO's since March 7th. He is on the band, 14255, A3, daily around 0200 to 0400 GMT. He will leave Swan Island sometime in June and have all QSL's out in July (West Gulf Bulletin) . . . Unfortunate circumstances have caused OY7ML to QRT and return to Denmark . . . W5ALA reports that I1ZJG can help with sked for M1B, also, ZD6DT, when back from vacation, can arrange sked for I5FL contact . . . Danny Weil, of YASME fame, continues his campaign towards YASME II with mutally happy visits to Dayton, Fort Dodge (Iowa), Cedar Rapids, Kansas City, St. Louis, Dearborn, Cincinnati, Trenton, Washington, Alexandria and Philadelphia under his belt. June 2 to 10th should find him in the Boston area where a series of lectures are being arranged via the efforts of W1DQH. He appeared in the Groucho Marx TV show on April 25th and Cathy Godfrey radio show April 27th. Funds on hand approximate about a third of what will be needed to launch him again. Several offers to donate radio gear have been received from various manufacturers so it seems that this phase of the matter will not present any problems. WE STILL SOLICIT INVITATIONS FROM RADIO CLUBS, ROTARY CLUBS, KNIGHTS OF COLUMBUS, KLU KLUX KLAN OR WHAT HAVE YOU. Danny's present dates will bring him to the Chicago, Atlanta and North Carolina areas after June 1st. Invitations from other Clubs in those areas would be very welcome.

73, Dick, KV4AA

VHF

Sam Harris, W1FZJ
P. O. Box 2502, Medfield, Mass.

Dayton Hamvention

"CQ" was well represented at the Hamvention. In addition to ye honorable editor, Wayne Green, VHF editor Sam Harris, assistant VHF editor Helen (Hoy) Harris, contributors Bob Rafuse (W1RUD) and Paul Day (W1PYM), almost two thousand subscribers were present. Wayne held "wallet inspection" services for those unfortunates who admitted to being non-subscribers. In most cases the parties concerned were found financially solvent and were admitted to the fold as full time "CQ" subscribers.

The VHF forum, while larger and longer than last year, was still too short. The discussions led by myself and the short talk by Bob (Bolide) Rafuse, were topped off by an excellent discussion on getting more power from your VHF transmitter led by Bill Ashby (K2TKN).

Excellent organization spark plugged by Bill Ingling (W8SVI) made the forum a very real part of the hamvention. Only criticism worth mentioning was the short (two hours) time allotted for VHF. Here's hoping for another good one next year.

The recent Dayton Hamvention gave me the opportunity to meet a large number of prospective VHF'ers. The most often asked question was: "What's in it for me?", closely followed by: "Which band should I start on?". There is not, of course, a simple answer to these questions. A first approximation of my stock answer is as follows.

Ben Bissman (W8HXT) Mansfield's gift to six meters.

The enjoyment which you get out of any band is directly proportioned to how much you are willing to invest in terms of time and effort. If you are interested in ragchewing, it is well to note that just as large a percentage of VHF'ers hold RCC certificates as any other group. All the VHF bands offer the opportunity for long and uninterrupted QSO's. The number of different stations available to talk to at any given time, will of course, depend on your geographical location and your equipment. I wouldn't, for instance, advise anyone in Wyoming to get on two meters with a communicator and a quarter wave whip. I am sure that from the ragchewing standpoint he would do much better with the same power and antenna on 160 meters.

However, if the same fellow in Wyoming is willing to put some effort into building up a good VHF station he can look forward to many thrilling hours of operating. Almost every contact he makes will be a "first". The trail he blazes will be his own and his fame will proceed him wherever he goes.

DX working on the VHF bands presents a challenge which cannot, today, be found on any of the lower frequencies. In fact, there is no such thing as DX on the low frequencies. There is artificial DX in the form of "rare countries" but there is no challenge involved. Anyone who happens to be home when the rare one is on can work him.

The VHF worker's DX is far from artificial. It exists in the form of a true distance barrier. When Walt (W4LTU) in Florida worked Bob (W9GAB) in Wisconsin, they demonstrated their ability to overcome this distance barrier by dint of their own efforts. Their pride in their accomplishment is justifiable. No low frequency band can offer as difficult a feat as this. Nor need they, for they are established communication bands. If you want to talk to Empty (ZS6KD) you naturally use twenty meters. If you want a chat with Butch (W9EWC) you go on seventy-five meters, etc. If you want to do something different, if you want to try pioneering, you go to the VHF bands.

Which One?

I'd like to be able to say that all the bands were equally attractive. Unfortunately this is not so. Only two meters and six meters are presently enjoying any reasonable amount of activity.

The amateur bands above 220 mc. are primarily experimental from the activity point of view. Unless you are a determined experimenter with no regard for making contacts, it is wise to operate these bands only in liaison with two or six meter activity. Even in densely

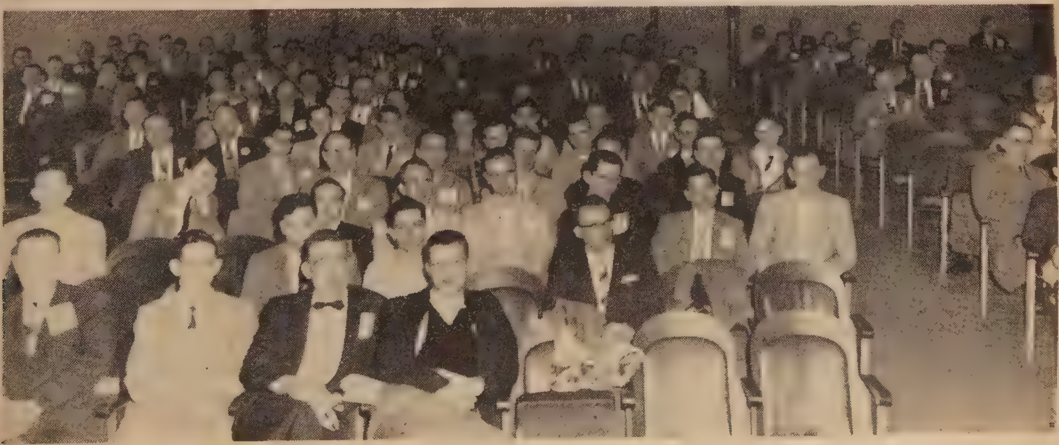
VHF populated New England, the 220 mc. gang has a special night for making contacts. There is a wealth of work to be done on these higher bands and nowhere is the opportunity for you to exercise your ingenuity more pronounced. If you really want to be a trail blazer, the 1.7 meter and up bands are your meat.

Activity, however, is most likely to be found on six and two meters. The choice between these two bands is wholely determined by your likes and dislikes. If you are a serious dx worker and are really interested in proving your ability, then two meters is the natural choice. Here you will find the majority of the serious VHF dx men. Here, on a band where dx is worked by might and main, rather than by fortuitous band openings, the opportunity exists for anyone willing to work at it.

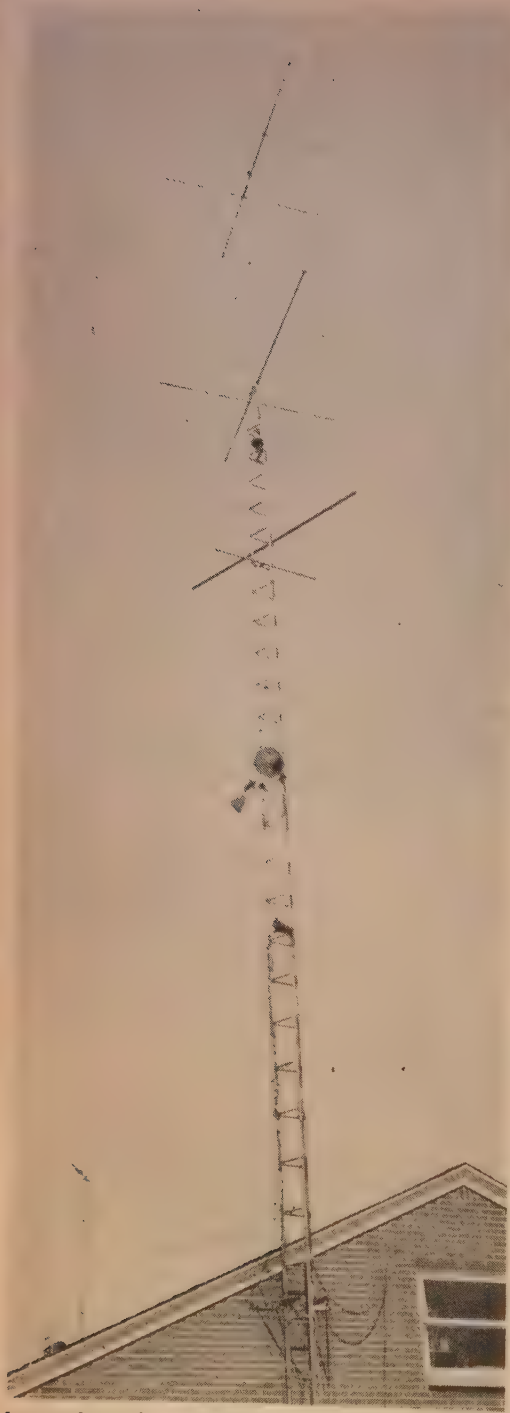
Minimum equipment on two meters is 100 watts and a twin five beam. The beam should be located above surrounding objects such as trees and buildings. Extreme height is not necessary (except for a loud local signal). Geographical location is of little moment although being hard up against a mountainside is not considered helpful. With a good receiver (i.e.: better than 6 db) your normal working range will exceed two hundred miles. With good selectivity in your receiver and the use of cw, your reliable contact range can be pushed out to three hundred or four hundred miles depending on the equipment at the other end. Remember, a set up such as this is the rock bottom for dx work. Improvements in equipment will not greatly increase your range but will greatly increase the ease with which contacts are made. On auroral and meteor scatter type of propagation which allow contacts up to the fifteen hundred mile mark the higher power and larger antennas really start to pay off. Whether the additional work and expense of a larger set up is worth the additional contacts is a matter which only you can decide. If you've got some time to spend and a yen for something new, two meters is your dish.

Henry Cross (W100P) and Tony (VE3DIR) looking pretty for the camera. (Helen lurking in background.)

Six meters, while classed as a VHF band, is in the never-never-land between the low frequencies where long distance communication is an everyday occurrence and the ground wave and scatter type VHF bands. In short, it is just above the normal MUF. When the sunspot activity is high, the six meter band can afford communication over vast distances with little or no thought to high power or big antennas. Sporadic E propagation allows con-



VHF forum at Dayton Hamvention. (Wide angle lens wasn't wide enough.)



4 over 4 on six at the Beer Baron's home, (W8HXT) Mansfield, Ohio.

tacts over distances up to fifteen hundred miles (single hop) using power as low as is practical (5 watts or so) and antennas in name only. Minimum equipment for the six meter band is ten watts and a three element beam. If you want good ground wave coverage, a five element beam mounted well in the clear will pay big dividends.

Probably the most serious deterrent to any serious dx work on six meters is the frequent band openings enjoyed in the spring months, due to sporadic E skip, and the world wide type openings provided by the present, all time high, sunspot cycle. There is little incentive for higher power or bigger beams to work an eight hundred mile scatter circuit, when you have just worked three thousand miles with five watts and a ground plane. If you're looking for a band chockful of surprises, six meters will fill the bill.

VHFest

Reprinted below is the announcement of the second annual VHF get-to-gether sponsored by the D.A.R.A. Last year's "do" netted over three hundred VHFers. See you there?

VHF'ers BE SURE TO ATTEND THE
2nd ANNUAL DARA

VHF EST

JUNE 16, 1957
WALDRUHE PARK
10 Miles South of Dayton
on Route 741

MEET THE 50 — 144 — 220 — 420 MC. GANG

PRIZES! SOFTBALL! MOBILE CONTEST! HORSE SHOES! SOFT DRINKS! HOT DOGS!	**BRING**	YOUR XYL (OR YL) YOUR CHILDREN (Play area Available) YOUR PICNIC LUNCH YOUR JUNK BOX

$1.50 Donation per Licensee

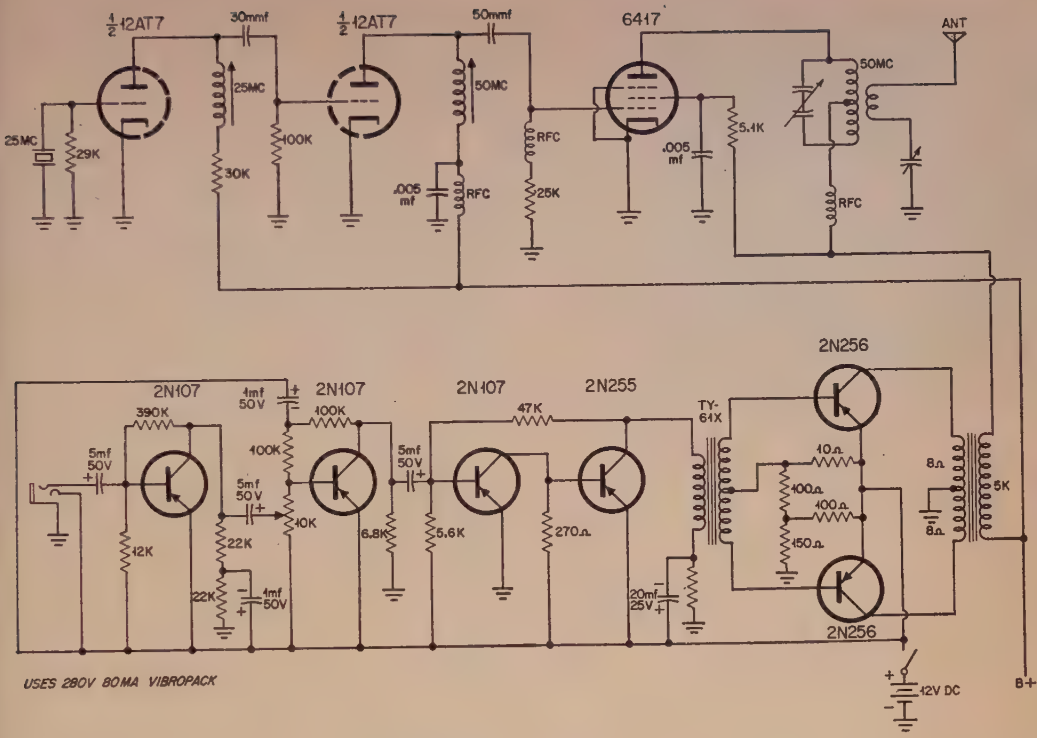
Syracuse VHF Roundup

While on the subject of Hamvention. Now is the time to start planning for the Syracuse VHF Roundup. Advance registration will help the Syracuse boys to do a better job. Judging from past performance this is one you can't afford to miss. See you there?

VHF Program:
9th ARRL Convention

As moderator of the VHF forum, I naturally expect all of you to be there. John Landeck (W9WOK) sends the following information on the coming convention:

"A complete VHF program is planned, including a series of technical sessions covering all major phases of VHF. Contests such as a 420 mc. hidden transmitter hunt, VHF banquet, and *an open forum will be held* at which time area VHF activity, policy, resolutions, and future VHF organization can be discussed. Awards of special interest to the VHF group will be presented at these sessions. In addition, a special award will be made to the individual or group that submits the most constructive suggestion, program, circuit, or equipment design for the promotion of VHF.



W8PYQ's Junk Box six meter mobile, with the transistorized speech and modulation. Write John for details.

The Midwest VHF Club Award, 'VHF Man of the Year', will be conferred upon the recipient for the year of 1956.

"It is certain that this will be the largest group of VHF people yet to be assembled, so it affords the best opportunity to meet or renew acquaintences with your VHF friends. The Midwest VHF Club cordially invites each individual, VHF Club, or VHF club delegate to attend the convention. Limited accommodations for the VHF banquet suggests that advance purchase of tickets be made for this function. Information can be obtained by mailing inquiries to the Midwest VHF Club, 4222 Foster Ave., Chicago, Illinois. In order to be seated at a VHF table at the main banquet, it is suggested that preregistration be forwarded through the Midwest VHF Club. In any case, please drop a line to the club if you expect to attend the convention."

Bill Ashby (K2TKN) makes with the mike at the Dayton Hamvention.

Irving, Texas Wayne Armstrong (K5DCQ) comes forth with the following:

"Six meter band opening—Northern Texas (only) to Argentina, from approximately 1250 hours until 1320 hours CST, as follows: 1253—heard LU4AY, 1254 called LU3DD and received reply! First South American! Jose was running 100 watts to a two element beam. He asked me to look for his friends LU7AT, LU9AS and LU4AY. We signed at 1300. 1300—I heard and called LU7AT—Nil. 1303—Heard and called LU4AY—Nil. 1306—Called LU9AS and talked with Hector until 1313. He gave me no power but was using a four element beam. 1314—Called LU9EV and had a short contact. Colin faded at 1317 and at 1320 the band was dead.

"I'm using a communicator, only one week old. The signals were fairly tearing the cone from the speaker, however they were not closing or even moving the eye on the communicator. Very slow QSB on fades, signals would go to zero. I don't believe this was scatter.

"Excuse the 'improptuness' of the letter, I'm in a hurry to mail the QSL's to my first S.A. contacts!" *Congratulations Wayne! Just one thing. Your letter was dated March 28th, wonder if this was the same date as the opening.*

Alexandria, Virginia Here's some information from W4KPK:

"Will be operating six meters from Mercury, Nevada, (Atomic Proving Grounds). Will operate from 50.040—52 mc, May to July mostly during the week ends. Using a Gonset and two element beam. Hope we have some east openings." *Sounds good O.M., and very likely to have those openings too. Lots of the boys could use Nevada so we'll all be looking for you.*

73, Sam, W1FZJ

NOVICE

Donald L. Stoner, W6TNS
P. O. Box 137
Ontario, California

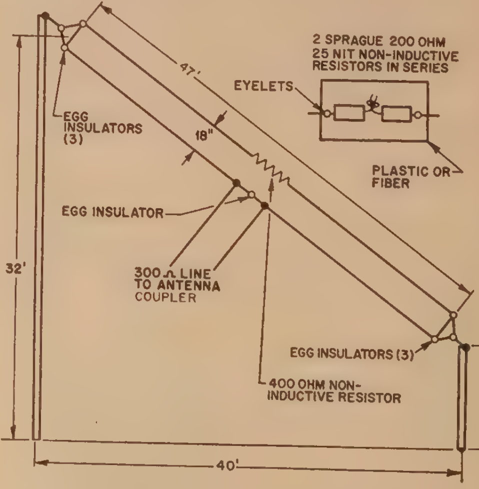
Comes that time of the month again, so as Jackie Gleason says, away we go. As mentioned last month we are going to discuss a small space antenna and a simple control system for your rig.

The T2FD

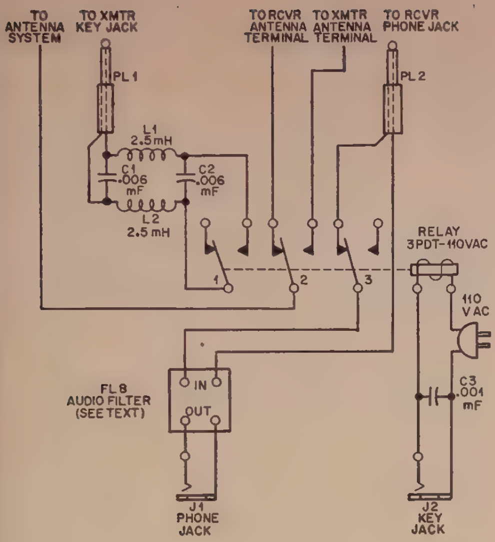
CQ magazine, in another of its "firsts" brought out the "Terminated Tilted Folded Dipole" (T2FD for short) several years ago. The antenna was extremely popular and is still used today by many operators. The tremendous advantages of the T2FD make it a natural for the Novice, especially when the backyard space is at a premium (as I was reminded in the letters column last month). What are these tremendous advantages? Well, first of all, unlike the horizontal dipole, it is relatively non-directional. This means that it receives and radiates in all directions. Of course, that *can* be a disadvantage when the QR mary is coming in pell-mell from all directions. The T2FD can be used on several bands. The dimensions given here will produce the best results on the 80, 40, and 15 meter Novice bands. The antenna takes only slightly more room than a 40 meter dipole and only 40 feet of ground length. Since it operates as efficiently as most 130 foot 80 meter dipoles, it is a boon to the "hemmed in" novice. From the reports on the T2FD, it appears to be a real DX hound on the 15 meter band.

How can I make the T2FD? The accompanying diagram explains it pretty well, but a few words of explanation may aid the constructor. First obtain a 100 foot roll of stranded copper antenna wire and cut two 47 foot lengths. Cut each 47 foot length in the center (23½ feet) and between two of the pieces, install an "egg insulator." Mount the two Sprague non-inductive 200 ohm resistors on a piece of fiber or plastic and connect them in series. Connect the resistors on this strain relief plate in series with the other two 23½ foot wires. From the scraps left over, cut two 19 inch wires and use these to "short" the ends of the dipole. Across the egg insulator in the center of the antenna, connect enough 300 ohm twin lead (TV lead-in) to reach into the ham shack. The length is not critical. The antenna should be mounted on "mutt and jeff" poles, one roughly 6 foot high, and the other 32 foot high. Quite often it is possible to extend the antenna from the peak of the house to a convenient 6 foot high object in the backyard. Preferably, neither pole (or object as the case may be) should be of metal construction. The "shorted ends" of the antenna must be insulated from the supporting structure with at least three egg insulators as shown in the diagram. Use rope to reach from the egg insulators to the supporting structures.

Once inside the ham shack, the 300 ohm feed line should be connected to an antenna coupler much as those described in the Handbook. Most modern transmitters use low impedance coaxial transmission line and since TV twin lead is a relatively high impedance balanced line, a device like the antenna coupler is necessary. A "balun," such as the Air Dux all band model, would work satisfactorily also. Although it is possible to use a link around the final tank coil, I would not recommend it where the possibility of TVI exists. Since this is a multiband device, second harmonic radiation will be high, unless an antenna coupler is used. In extremely rough locations one should use a *low pass filter* (a TVI filter as they are commonly called).



The antenna loads up about the same as any other. However, when adjusting the antenna coupler, try to get maximum loading with maximum capacity in the pi network output adjustment.



The Octopus

So many of the letters I received ran something like this: ok, now I have my Novice license. How in the name of heaven do I hook all this stuff together so I can get on the air? Frankly, I had the same problem when I was a Novice and just starting out on the air. I devised a simple system so that I could go from receive to transmit in a minimum of time. The accompanying schematic shows how it was wired up with one or two frills added for convenience. The FL-8 filter can be inserted in the head phone line as shown to produce some audio selectivity. That is, the FL-8 passes audio signals around 1030 cycles and discards all others. As you tune your receiver across cw signals, they will each peak up when they approach the resonant frequency (1030 cycles) of the filter. This makes it easier to separate stations. Naturally the FL-8 can be used by itself in your present installation simply by connecting it between your head phones and the receiver. These filters are available from Arrow Sales, P.O. Box 3007, N. Hollywood, California and the price varies between 98 cents and $2.98 depending on the external appearance.

The components L1, L2, C1 and C2 are used as a "key click filter". Although these parts could be eliminated, the reduction in key clicks more than offsets the small extra cost.

How it works: The diagram shows the "Octopus" set for receiving. Note that the antenna goes to section #2 of the relay and then to the receiver antenna connection. The headphone signal goes to section #3 of the relay, through the FL-8 filter to the phone jack, and you are receiving normally.

The key breaks the voltage to the relay coil. Whenever the key is depressed, 110 volts is applied to the coil energizing it and that pulls the contacts down to the transmit position. Under these conditions, section #1 turns on the transmitter, section #2 switches the antenna over to the transmitter and section #3 opens the headphone circuit so you don't get a blast in the eardrums.

Construction: No construction details are given because there will be as many versions as there are readers. It is possible to build the "Octopus" on a 6"x8" piece of varnished pine (my preference) or in a small LMB box. Some might want to incorporate the circuit in their existing antenna coupler box. If you use the pine board, mount J1 and J2 on metal brackets or on a thin wooden "front panel". The key click filter components may be mounted by passing wood screws through ground lugs, mounting them on the board, and soldering in the components. The FL-8 may be held down with wood screws.

Additional Notes: To use the "Octopus" for fast change over, leave your transmitter on all the time. The open key circuit prevents it from emanating a signal. If your receiver has a standby connection, use section #3 of the relay to short the standby terminals on receiver, and connect the FL-8 directly to the receiver phone jack. If you use coaxial transmission line to connect your equipment, use section #2 to transfer the center conductors. Bond all three ground braids together near the relay. If you use an antenna coupler, it should be connected between the antenna and section #2 of the "Octopus" relay. Before testing the "Octopus" manually actuate the contacts of the relay to see if the antenna is transferred to the transmitter at the same time section #1 contacts. It is better if section #2 makes connection just before section #1. Some transmitters will *chirp* badly if the antenna is connected after power has been applied. If this condition exists, you can bend the contacts of section #2 slightly so it *makes* before section #1.

Incidentally, if you wonder why I call it the "Octopus", build it and connect it to your gear and you'll have the answer.

Who's being heard in Europe

Here is the latest word from Tima Popovic, YU1RS, Banat-Novo Selo, Yugoslavia. He advises that the following stations have been heard in Yugoslavia on the dates listed:

March 15, between 17:45 and 19:15 GMT: WN1OQG, LPD, NRE, KN1ACC, ABO, KN2TSI, UER, WN3JBJ, HSY, IJA, KN4-JME, KJN, KCB, JJZ, KN5GHS, KN9EOF, KNØNN.

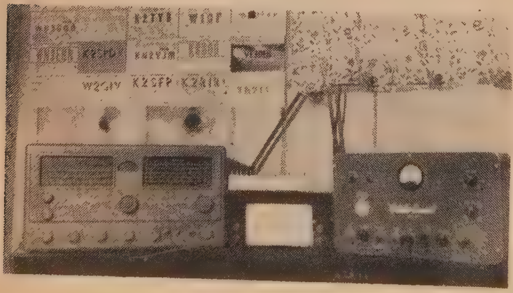
March 16, between 16:30 and 19:00 GMT: WN1LTN, KJA, OOH, LMV, OAP, NQU, LRI, KN1AOK, AIK, AVS, KN2VIO, UEA, RYU, UXB, VQL, VMM, UMS, WN3GSU, KXC, JYF, HZO, KN4LNQ, JZE, LJD, MAH, LXT, MKE, MVV, KN6THG, KN8DEY, CVQ, CPZ, DVZ, DYZ, CUW, KN8AZC, CZA, EAW, DTO, KN9GTK, GVE, DDZ, DMZ, EAY, KN0IFG, HHP, HWB, HGQ, IKV.

March 17, between 16:20 and 20:00 GMT: WN1NZF, MEK, OPB, MDO, KN1ADB, ASB, AWP, ATU, ARP, KN2SFO, VNL, VTL, VAC, TYY, UPD, YKJ, UFM, RYK, VQA, SXR, WN3HIT, JEL, IJV, IXM, IHN, GRO, HSP, JJC, KN4KHO, BOJ, LWR, KZX, LTI, LXA, MZA, LXT, MYR, KLK, IMC, LTA, INY, ILC, KN8JBC, DYX, CEF, BQV, BWF, DJZ, KN9DID.

March 18 between 17:25 and 20:00 GMT: WN1NKV, LMV, AXK, ATY, ATW, AAS, KN2ZAQ, UZU, YLC, TQR, WN3HWM, KN4OBC, KIC, KN5JMY, ISW, IUY, GDH, IOQ, KN8BVI, KN0HWK, GJX, IVR, HGB, TBD.

March 21, between 19:40 and 21:00 GMT: WN1OQC, KN1ACU, JZY, KSI, KN2FXA, UMH, UYF, ZAQ, VRA, VKR, KN7GHQ, KN8DAZ, KN0IIS.

March 24, between 16:40 and 21:00 GMT: WN1NOK, LTN, NQR, JEV, JIC, KN1AYW, KN2VKR, SSU, VXF, UWY, VPB, ULZ, UBX, VWJ, WN3IWF, ITF, JYM, HQO, HWQ, JWH, KN4OAO, KKQ, JFE, MQL, MLM, OBE, MHY, MRZ, MHV, JDX, KN5HGK, IUZ, KN6VBK, KN8EGD, TCD, BIT, CKN, CMV, CTK, CQJ, CRA, KN9DZK, DTH, EIL, GTX, GPY, DXE, KN0HXX, ZJF. 73's Tima Popovic. Many thanks, Tima, and we'll be seeing you next month again. I understand quite a few of the novices have been floating around on "cloud 8" since they found out that their "rock crushers" have been getting across the Atlantic. Congratulations to all these fellows and maybe my call will be on the roster some day.



The neat and powerful station of Al (Skip) Graham, KN2SCL, 13 Brook Street, Lakewood N. Y. Skip has worked 6 states in 5 call areas and a VE3. He has received an 85% return on his QSL cards sent. Wat say, you 15%'ers?

Net News

California novices have started several nets. One of interest is the Novice net on 3733 kc. It convenes at 4:00 PM Sunday (PST) and is attended by many Southern California Novices. For more information, contact Ron Angle, K6KYG, 181 E. Green, Claremont, California. Further up north, we find the 2 meter net. This net is called Tulare County Novice Net (TCNN). The net convenes at 9:30 AM on Sunday (PST) on any 2 meter frequency. So far we have about 8 members in the net. If anyone wants more information write KN6YDW, Johnnie Neeley, Route 4, Box 21J, Tulare, California, who is net control. Any novices in the Lansing, Illinos area wishing to form a net should contact KN9GNM, 18745 Henry Street, Lansing, Illinois. All requests will be answered.

Sometime ago, information was requested on Novice QSL bureaus and I didn't have the answer available. Walt Burdine, W8ZCV, advises me that the National Novice Technician Assocation, Fruit Street, Fresno, California, gives the latest list of QSL Bureaus. More news of QSL Bureaus comes from KH6BIF, Melvin Ohara. The NNQB for the Hawaiian Islands (KH6-WH6) has a new address which is now: Melvin Ohara, KH6BIF, 1251 Aala Lane, Honolulu, T. H. Please send all QSL's to this address.

Help Offered

Someplace I heard the idea of starting a novice equipment bank, but for the life of me I can't remember where. Its a pretty good idea and runs something like this: A local club interested in helping novices get started pools equipment that is not currently being used by the members. When a new novice gets his license the club loans him a rig to use until such a time as he can purchase one of his own. I think the idea has merit and you might bring it up at your next club meeting, it will certainly start a lot of discussion. I have a DX-20 that I will loan to a local club who is planning on starting an equipment bank or already has one. That should start the ball rolling.

It certainly pleases me to receive letters from hams, clubs and organizations offering to help new novices. Here are some that may aid you if you are planning on taking the big step on the "big, big step".

The West Covina CD headquarters, 2441 E. Cortez, W. Covina, California, offers code and theory classes every Monday night. I understand the Hamfesters Club training class at Chicago Vocational School teaches theory on Monday evening, 7:00 to 9:00 and code on Wednesday evening. This class is available to Chicago would-be hams and for more information contact W9PSP. K8DBL, 5831 Clearview, Parma 30, Ohio advises me "I would be glad to help anyone get their license". W2HNG, Saul Schacket, 135-30 232nd St., Springfield Gardens 13, New York writes "In this area both W2HNI and myself are always available for help toward passing exams. Code practice is offered on Monday evenings, 7:30 to 8:30 at 145.44 mc, to novices in the 2 meter band. We are planning a license preparation course to begin in late April, running for 10 weeks. It will be given in one of the evening High Schools in Jamaica or Laurelton, L.I. Applicants are asked to write us as early as possible".

WN1NYK blasts out a potent punch with this "lash-up". In about 5 months of operation he has worked 335 stations in 45 states, Canada and Europe, including G's, DL's, OK, ON, EA, PA0's and an OA in South America.

From the size of that smile, I'll bet that Bob Wood KN0HUD just worked a bit of rare DX. The WRL Radio Reference Map can be found in most Novices' shack and does a lot to dress up a station.

Help Wanted

Jack Hienz, 320 13th St., Ellwood City, Penna. Telephone Plaza 88554 (Age 12) would like advice in getting started in the field of ham radio.

Richard Glassbrenner, 1141 Wood's Run Avenue, Pittsburgh 12, Pa. (Age 30) would like to know if there are any clubs in Pittsburgh or any hams who would be willing to help a newcomer to the hobby.

An impressive layout is displayed by Dick Frieders, KN9DKP, 609 North Root St. Aurora, Illinois. Dick has worked 41 states and 6 countries on 40 and 15 meters with an NC-98 and a DX-35.

William Eldert 1409 So. 10th St., Pekin, Illinois would like help on the code and would like to meet a General Class ham who can give him the Novice test.

Alvin Jastrzemski, 5534 So. Natoma, Chicago 38, Illinois would like to join a club or meet a ham that can help him get his Novice ticket.

E. Merken, 709 Westmount, Los Angeles 46, California would like to join a club or meet a ham that can help him get his Novice ticket.

H. Michael Grimes, P. O. Box 992, Gladewater, Texas would like help with the code and theory so that he may obtain a Novice License.

T. S. Samuel, 4809 Saratoga Avenue, Downers Grove, Illinois would like to meet a ham and obtain advice on obtaining his Novice license.

Thomas J. P. Shannon, Pfeiffer Ranch, Rt. No. 1, Box 444 Redlands, California is a real "old timer" and held calls SI, SIM and CQJ. He would like to get back in the game by obtaining his Novice license.

R. C. Travis, 920 Atwater Avenue, Bloomington, Indiana would like information and help on obtaining his Novice license.

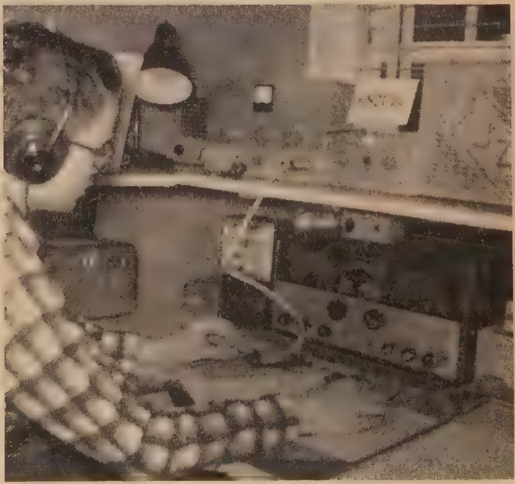
Paul R. Lodholtz, 19 East Main, Fremont, Michigan needs help with the theory.

Oscar Miller, Mantua, N. J. needs a little prodding on the way to obtaining a Novice license.

Chuck Billante, 6431 South Canterbury, Parma 29, Ohio would like to obtain a Novice license and would like to hear from amateur pen pals.

Lynne O. Beall, Sr., Route 1, Box 422, Atascosa, Texas would like help with the theory.

Earle Gray, Rt. No. 1, Elk, Washington (Age 19) would like advice on getting started in ham radio.



Gary Lindstrom, KN2UZJ, is a dyed in the wool ham radio addict. His equipment includes a Heath AT-1 running 30 watts to a 661 dipole. Receiving equipment includes an SX-99, a Heath QF-1 and a National SW-54.

Ray "Slim" Schiniel, WN1LCX, Rfd No. 2 Showhegan, Me. is running a home brew 6AG7, 6L6 rig running 45 watts. His 40 meter DX includes PY1BIZ, WH6CEA, VP5BH, KV4BK, KP4CC, WP4-AHH, VE1, 2 and 3.

Letters to the Editor

Dear Don: I am going on 6 meters and would like to know where I can get the conversion data on WRL's Globe Scout. Walt Burdine mentioned an article on this and wondered if it was in CQ. 73's Walt Cantillon, 1624 Lincoln Avenue, Dubuque, Iowa. *Sorry Walt but there has been no information on such a modification and I don't know of any coming up. However, next month we will have a conversion to 6 meters on the Knight 50 watter. Possibly you can adapt the instructions to your transmitter.*

Dear Don: Since you are so close to my QTH, I thought I'd drop you a line and tell you the activities of my station KN6TWD. I am 14 years old and am in the 9th grade and I have had my ticket for seven months. The rig is a Knight Kit, running 50 watts and the receiver is an HQ-150. The antenna is a 66′ longwire. In my seven months in the air I have worked 38 states with 35 confirmed. In the way of DX I have worked Alaska, Hawaii, Canton Island, Marshall Islands and Puerto Rico. I do most of my operating on 15 but do go on 40 occasionally for rag chewing. I will sked anyone on 40 or 15 needing California and I would like to sked Delaware and Rhode Island. All letters will be answered. 73's Mike Johnson KN6TWD, 4760 Genevieve St. San Bernardino, Calif. *Wonderful on the DX, Mike. I hope no one ever asks me what my best DX is—Hi.*

A letter with sage advice comes from Milton Kenney, 9226 Omar Khayyam, Valley Station, Ky. (KN4MPZ). He says:

Dear OM: I've had my ticket now for 2 months and work 40 and 80 meters using a SX-99 recvr. and a Lettine xmitter running 50 watts. The antenna is a 66′ folded dipole with a Mosley Loading coil on 80 meters. Would like to see something on antennas in your column. A friend of mine (K4CJA) told me, "If you've got $3.00 to spend on Ham radio, spend $2.98 on the antenna". From my short experience I've found that to be good advice. W1 73 OM, hope to work you sometime. Milton. *Those words are good advice for anyone, Milton. As an example, it is possible to work Europe with only one watt of power if you are using a good beam.*

An "about ready to go" Novice is Frank Gilmore, Route 2, Box 286A, Springfield. Missouri. He writes:

Dear Don: I have my test and will take it this weekend. There's a new Adventurer all ready to go. I have one problem, no antenna that'll load. I wan to work 80 and 15. What can I do for about $5,000 The receiver is an S-85 and a Heath F-1 which works fb. 73's Frank. *Suggest that you try a T2FD, Frank and let me know what you think of it as a Novice antenna. Say—how do you know your antenna won' load—Hi.*

Just to prove some teachers are "good Joes" (Hi—I'm one myself) Bill Schwarting, Scotia-Glenville Central Schools, Scotia 2, New York writes:

I am an English and Social Studies teacher in the Junior High School here. Because there seems to be a great deal of interest here and no one to carry the ball, I started a Radio-Electronics Club. I'd like to get a Novice ticket along with the 25 or so boys who are interested. Code will be the problem for all of us. The technical part of the test doesn't look too difficult in the License Manual. Best regards, Bill. *Good luck to you and the boys, Bill, I wish you all the success in the world. If I can be of any help please let me know.*

A man with a problem is L. Richard Woodyatt, 1901 E. Mountain Road, Scranton, Pa. His problem:

Dear Don: I have a Hallicrafters SR10-A all wave receiver but it has no BFO or receive/standby switch and I would like to fix it up as a communications receiver for use when I get my Novice ticket. I have the theory for my license but am having trouble with the code. Yours truly L. Richard Woodyatt. *Fine biz, Dick, and I am sure someone can send you the necessary information. Good luck on the test.*

Joe Hancammon, KN5IFT, 210 Sheridan Road, Fort Bliss, Texas writes:

Dear Don: The rig here is a Heath DX-35, an AC-1 and an SX-99. My antennas are 66 feet long and 135 feet long. They have really helped me rack up the contacts. I have made 100 QSO's in 18 states and one XE2 since November. I was wondering if I could get my xmitter on 2 meters. I will say best of 73's Don, Joe. *Sorry to say that the DX-35 and similar transmitters will not function that high in frequency. I hope to have some simple two meter gear featured in the column in the near future.*

In the "I'd shoot him if I had a gun" department comes this one:

Dear Don: I was just looking at ur "Miscellaneous Nothings". I guess you were in a bad way for letters (gasp, cough-cough, gasp) so here is mine. I get my call with the "N" in it on the fourth of April, '56. I got the general in the last part of September '56. I am 14 years old and in the 8th grade in Jr. High (the only ham in the school). The rig is a Heath AT-1 running about 30 watts to it on all bands. I have a modulator for it using a 6L6 in Heising Modulation fashion. If any of the ex-Novices are looking for a VFO, the Command set works very well. It works fine on my AT-1 and I think it will work on most any xtal controlled rig. Just don't use it until you get the big ticket (hi-hi). Keep up the gud work. 73 Bill. *I was just kidding, of course, Bill. However, I do have zillions and zillions of letters now. Keep them coming though because that is the part of the column that everyone seems to read first.*

Pete Roussel, KN5JCC, 6515 Brompton, Houston 5, Texas has made 50 contacts in 13 states with a ticket that is 4 weeks old.

In the better late than never department, arrives a letter from KN2UZU, 16.

Dear Don:

Now I've passed my General and I have decided to write. In five months as a Novice, I worker 40 states, CN8 and KZ5 with a Globe Chief, SX-99 and a 40 meter dipole for that and 15 meters. I hope to get a tri-band beam and I am interested in 6 meters also. I will make a sked with anybody for any reason. My freqs. are 7173 and 21,203. 73's Sal Palamaro, Round Lake Park, Monroe, New York. *I'm glad that you finally did write, Sal. I am always happy to hear from ex-Novices that made the "hurdle".*

New Mexico is represented by Jerry Richardson, P. O. Box 903 Deming, New Mexico who holds the call KN5IKL. Jerry is on 40 meters and will sked anyone needing New Mexico for WAS. All letters and QSL's will be answered.

Myron Smith of 318 E. Van Buren, McAlister, Oklahoma, writes:

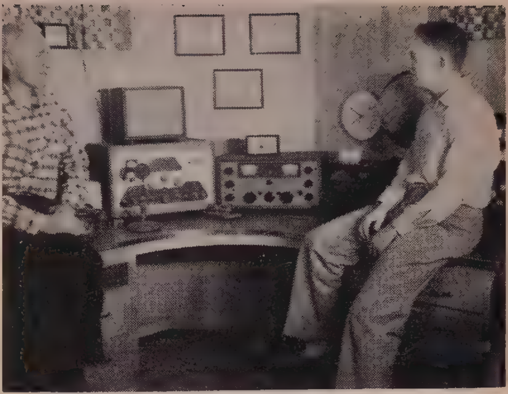
I am a subscriber to CQ Magazine and noticed your article on "Snortin Morten". In my search for parts I found I could not locate a Triad S-51X transformer. Can you name a substitute for the given transformer or the source from which the original came? I appreciate your efforts very much. By the way, I am not a ham, but soon hope to be. Yours truly, Myron Smith. *I hope that you are too, real soon, Myron. The transformer is in no way critical and any universal audio output transformer will work. However, people outside of California can obtain the transformer by writing Triad Transformer Company, 4055 Redwood Avenue, Venice, California. The amateur net is about $2.00 plus postage.*

A letter from Bob Beatty, KN4IEX, 2025 Radcliffe Avenue in Charlotte 7, North Carolina provides the following information.

Dear Don: Glad to have you in as head of the Novice Shack and hope you can keep up the good work Walt was doing. I will probably have my General in by the time this is printed. During my 10 months as a Novice I worked all states and 10 countries. Five of my 10 countries were on 40, 15 meters getting the other 5. DX was TF2, KG1, DU7, DL1, WL7, WH6, Ge and VE2, 3, and 4. I am thinking about building the 6 meter rig in the Feb. CQ by K2AVB to get on VHF. I am going to build it as a fixed rig. Presently using a Scout 65A, SX-99, Q Multiplier doublet and a window M. I am a member of the Rag Chewers Club and will help anyone that wants to get in. I will sked for any reason, WAS or otherwise. 73 Bob, KN4IEX. *Thanks for the newsy letter, Bob. The gang is always interested in what the other fellow is doing and how well he is doing.*

A letter from Groves, Texas carries the alias "Bigfoot". K5EKQ writes:

Dear Don: I sure enjoy the Novice Shack. I just worked a KZ5KK on 80 meter c.w. and I was running 50 watts to a DX-35. The antenna is a ¼ wave for 80- hi, a little short. I've worked 15 states now with the DX-35 on 80 meters. I sure wish you would print an article on operating procedure in the Novice Shack. It would help a lot of people out. It's 0111 now, so back to 80 c.w. 73's Don and good luck with the Novice Shack. Your pal, "Bigfoot", 2448 Ownen Avenue, Groves, Texas. *Nice Going, George. How did you get that "handle" anyway? If you hear me on 80 meters, give me a call and explain it to me.*



The very neat station of the father and son team of Vic (K6OKT) and Mike (K6IUN) 6455 Ben Avenue, North Hollywood, Calif.

Dave Still, of 173-17 103 Road, Jamaica, New York forgot to include his call. He writes:

Hi Don: The rig here is a Lysco "600", SX-99 and a 15 and meter folded dipole. In 2 months I have worked 18 states. I am also interested in UHF and VHF and would like to hear from some fellows interested in the same thing. Dave. *Fine business, Dave, keep up the good work. Next time you write, send your call along- hi.*

An "almost General" writes:

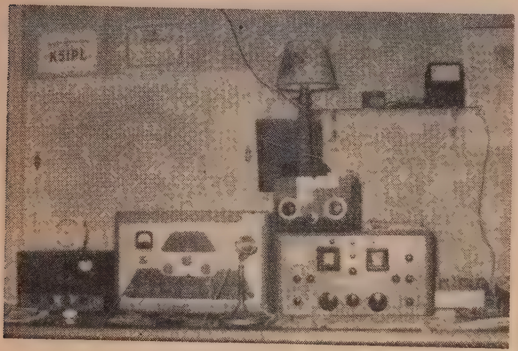
Hi Don: First of all, I would like to say congratulations on your new job as editor of the Novice Shack. I just passed my Conditional test. At the present time I am attending college in Newton, Kansas and operate portable there. My first rig as a Novice was a 30 watt homebrew job on 40 meters. I worked 32 states with it and an S-38C receiver. My best DX was a KP4. I now have a Globe Scout and Heathkit VFO and I am ready to go when the ticket gets here. Keep the fb articles in the Novice Shack coming, Don. It is my favorite part of CQ. Very Best of 73's John, KN0EQY. *Thanks for the kind words, John, we'll do our best. A look at the stacks of mail around here leads me to believe that quite a few people read the Novice Shack.*

Jim Potter W9GXC describes an unusual station. He writes:

Dear OM: I am a Novice Technician with *all* home brew gear. The receiver, not yet completed, uses the front end of an AR-2. The 6146 x-mtr runs 30 watts to a long wire. As soon as my monetary situation brightens, I hope to have a bandswitch xmitter running 75 watts on 40 and 15 with 90 watts on 6 meters. I did at one time have the thing running 75 watts on 40 cw (7186) but the 6X5's in my bridge rectifier power supply developed internal heater cathode shorts. So much for that. I have had one contact but lost him in the QRM. My lack of contacts in one month on the air is probably due to the fact that I stuck the 6AG7 and 6146 into convenient holes in the chassis and wires are going every which way. 73 OM, Jim Potter, W9GXC, 203 Court Street, East Peoria, Ill. *Sorry to hear that you have been popping 6X5's, Jim. You can avoid this trouble if you use a separate 6.3 volt filament transformer for each 6X5. This avoids the high heater cathode potential and the tubes will last indefinitely.*

From Madison, Tenn., comes a letter from Tony Stalls, 15, KN4KYO, 400 Neely's Bend Rd. He writes.

Dear OM: My call is KN4KYO I have been on 6 months and I have worked about 20 states and have 12 confirmed (I don't count a state worked until confirmed). My biggest gripe is about those that don't QSL, I QSL 100% (If I can get the address). I passed my technician test the other day and should be on 6 meters in about a month or so. I am on my 4th xmitter, the first one was junk; the second had harmonics, the third blew up, and the fourth (A Harvey Wells TBS-50D) I just got so I can go on 6 meters. The receiver is an NC-88 with a Windom antenna. I am putting up a 6 meter beam now. About the article in Feb. CQ, "How to make your wife like Ham Radio", please write one about "How to Make Your *Parents* like Ham Radio". BCNU- 73 Tony. *That's a good idea, Tony, I will take it under advisement. QSL's are one of the "great mysteries". Everyone says that they QSL 100%, but the polls show an average of 68% received. I wonder what the post office does with all those QSL cards—HI. Get a copy of SOS At Midnight for your folks.*



Herman Heard, KN5IPL, 600 Main St., Arkadelphia, Arkansas operates all the Novice bands. Herman needs Maine to have four corners of the USA. He will sked anyone needing Arkansas.

Dear Don:

Welcome to the Novice Shack and the best of luck on being the new editor. The rig here consists of an NC-98 and a Heath DX-20 transmitter. I received my license in November but was off the air until recently, when I put up a vertical. Within a week I worked 12 new states on 15 meters. Best DX was Maine and Texas. I am only on 15 meters but I can get on 40 if I have to. My crystals are for 21,120 and 21,150. I will also be glad to work anybody needing Minnesota for WAS especially W6's and 7's. One of my biggest troubles is TVI. I blank our screen out completely. Schedules can be anytime Sat. or Sun. and on week days from 4:30 until 6 oclock, CST. 73- Bob Wood, KN0HUD, 4625 West 7th St., Winona, Minnesota. *Fine business, Bob. Sorry to hear about the TVI trouble. If your neighbors complain, you don't have a leg to stand on, until you get it out of your own set.*

A letter from R. L. Frederick of Richmond, Maine brought some kind words and a plea:

Dear Don:

I think your Novice column is a great one mainly because of "Snortin Morten", this month. Keep coming across with items like this as I've already started to build mine. I'm studying code now and was looking for a code practice oscillator to build, but not anymore. I wonder if any of the readers would have information on a meter that I have. It is a McMurdo Silver Model 900 "Vomax". Any information on this meter will be appreciated. Thanks a lot. *Well, thank you too, OM for the kind words. I'll try to keep coming up with items of interest as long as they are requested. I'm sure someone reading this will have the information that you need, and will get in touch with you.*

Robert E. Lee will probably be a "general" by the time this is printed. (Gad! I made a pun, Ed.) In the DX dept., KN2TWK, has worked KH6 and has been heard in Belgium and Uruguay. His QTH is 40 E. Palisade Blvd., Palisades Park, N. J.

In answer to Joseph Sah's letter requesting information on putting the Adventurer on meters comes the following answer:

I'm working on it right now, using 8 mc crystals wit the oscillator on 15 meters and switching in a differen 807 tank coil for 6 meters. Having trouble getting enoug grid drive. Al Brogdon, W4UWA, 326 South Walnu Avenue, Cookerville, Tennessee. *Thanks for the information, Al. I expect that you may be getting a few letter soon.*

Out of the "I wish I could work that, dept." comes a post card from Carl R. Nelson, 462 Kanawha Ave., S. W., South Charleston, Wes Virginia (KN8BIT). He informs us:

Dear Don, Recently worked a rare one and though that U might be interested. WB6BE, Ben, QTH Canto Island, South Pacific. QSL says "only WB call in th world." He put in a fb signal to W. Va. on 21.160. U might pass the word on to the others through th Novice column. 73's Carl. *Many thanks for the information, Carl, I'm going to try to snag him myself.*

Another two meter man writes:

Dear Don, I just recently received my call, KN0IZE I am 14 years old and my chief ambition is to someda get a kilowatt transmitter. My hearing aid is a Halli crafter S-20 and my breathing aid is a Heath DX-2 running 50 watts. I would like to obtain some information on getting a cheap 2 meter converter for my hear ing aid and one for my breathing gear. Also, a cheap modulator for my transmitter. I am in the 9th grad at West Jr. High School in good old Duluth, Minnesota Yours truly Dave Sampson, KN0IZE, 219 N. 53 Avenu W. Duluth, Minnesota. *I wonder if you saw the articl on the BN-Iff converter Dave? It is very inexpensiv and produces good results. We plan a modulator for future column.*

Bud McClure, KN5IUO would have a terrible time sending this QTH on cw. It read Office of the Deputy Commander, Field Command Armed Forces Special Weapons Project Sandia Base, Albuquerque, New Mexico. H writes:

Dear Don, I am running about 70 watts on 40 an 15 meters thru a 6146 and having a great time. The receiver is an S-40A. My only complaint about Novice in general is the fact that they call too long. I actuall timed a Novice at 3½ minutes on CQ alone, but th generals (some) are about as bad. They also get i a rut on some occasions. I am stationed in the Ai Force here in Albuquerque and would be more tha glad to sked anyone for WAS on 40 or 15. Best 73's Bud *That sure is a fist full that you have to send Bud, o do you have a P.O.Box?*

A convert writes:

Dear Don, I recently switched over to 15 meters and have found it to be the best Novice band. 40 and 80 are too crowded. I would like to make skeds with any hams on 40 or 15 meters. I need some KN1's and WN7's. The rig here is a Globe Scout 65B and the inhaler is an S-85 with a "Q" Multiplier. Antenna is a 20 meter dipole. 73's Pete Roussel, KN5JCC, 6515 Brompton, Houston 5, Texas.

Hi Don: In 9 months as a Novice I have worked 40 states and my DX is VE3, CO2 and WP4. I am on 40 meters only. My rig is a Viking Adventurer and an SX-99. The antenna is a 40 meter doublet. I would like to sked Delaware, Georgia, Louisiana, Miss., Arkansas, North and South Dakota and Utah. Hope you have a long stay at the Novice Shack. 73's Bill Hamilton, WN3HKO, 334 Morado Dwellings, Beaver Falls, Pa.

Dear W6TNS: I am only ten years young, which as you see it is a pretty young age to start fooling around with Ham radio. For DX, I have 20 states confirmed, with a total of two countries. For distance, I have QSO'ed California and a ham a block away. The rig here is both an AT-1 and a converted ARC-5 teamed up with an SX-28. My code speed is up to ten words per minute. I will sked anyone needing the Garden State for WAS. Best of 73's Alan Birnholz, KN2VAB, 634 High Street, Newark 2, New Jersey.

Dear Don: I have been wanting to write to the Novice Shack for a long time, but decided not to until I got my ticket. I am on the air with a 6AQ5 but the only person that can hear me is about a mile and a half away. This should be corrected very soon though, because I have a DX-35 on the way. The hearing aid is an S-40 which is patiently waiting for a "Q" Multiplier. I am 13 years old and in the 8th grade here at Kellogg. I will sked anyone when I get the DX-35 and will try to answer all letters. 73's Jack Lyons, Wn7HRW, 618 McKinley Avenue, Kellogg, Idaho.

Dale Engler, KN9GHT, Veterans Hospital, Wood, Wisconsin has been horizontally polarized for quite a spell. He has worked about 40 states and KL7 land in three months but only 21 states QSL'ed. He would like to contact more DX on 15 meters. Dale can be found on 21.12 mc or 21.175 mc any afternoon.

Clyde Mason, KN0GJE, 855 S. West Avenue, Springfield, Mo. finally got his WAS by knocking off Vermont. Clyde will sked anyone needing Mo. for WAS.

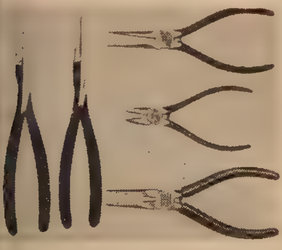
This gent forgot to supply us with his call. Gary E. Miller 5306 King Hill Avenue, St. Joseph, Mo. Writes:

Dear Don, I thought it was about time for me to write as I won't be a Novice much longer. I have been licensed for 3 months now and my code speed is up to 17 wpm. I have over 100 contacts in 36 states. I would like skeds with N. H., Vt., Maine, R. I., Del., all W7's and Colorado. I would like to know if it is permissible to operate as a Novice under Novice rules after I get my General ticket? I am trying to get WAS as a Novice. I operate on 80 meters only and skeds should be after midnight on Friday or Saturday. 73's Gary. *Sure you can Gary. There is no reason why you can't stay with-in the power and frequency limits of Novice operation. However, you can no longer use your Novice "N" call once you are on the books as a General.*

Alan Savery, Box 24, Vanceboro, Me., (Age 13) would like skeds with W5 and W7 for WAS. He will be glad to help anyone for their WAS.

Tom Homewook, K8AEN, 5209 Second Avenue, Vienna, West Va. needs Kansas, Oregon, Rhode Island, Vermont, New Hampshire, Wyoming and Arkansas for WAS. He will sked with these states or anyone needing West Va. for WAS.

Best of 73's to all my friends for another month. If all goes well, next month we'll have a conversion on the Knight (Allied Radio) 50 watter to 6 meters. A modulator is also planned for a future issue. ■



New Tools

Ever wonder what the horseshoe companies were doing these days? Well, the Diamond Calk Horseshoe Company, for one, is turning out some really excellent tools for us radio minded types. Like for instance their new diagonals and long nose pliers with a coil spring between the handles and the new long-reach solid joint Duck bill and Needle nose pliers. Look at the pictures and circle K on page 126 for more info.

Cool Ceramic Cilowat

Eimac has just come out with another batch of grey hair for the other tube manufacturers in the form of their ceramic 250 watt plate dissipation tetrode. The 4CX250 is available with either 26½ v or 6 v filament. Eimac will tell you lots more about these metal/ceramic tubes, their external anode and their concentric UHF terminals if you will nimble finger back to page 126 and circle M.

RTTY

Byron H. Kretzman, W2JTP
16 Ridge Drive, High Hills,
Huntington Station, N. Y.

Amateur Radioteletype Channels

National, FSK 3620, 7140, 27,200, 29,160, 52,600 kc.
National, AFSK 27.2, 147.96, 144.138 mc.
Area Nets:

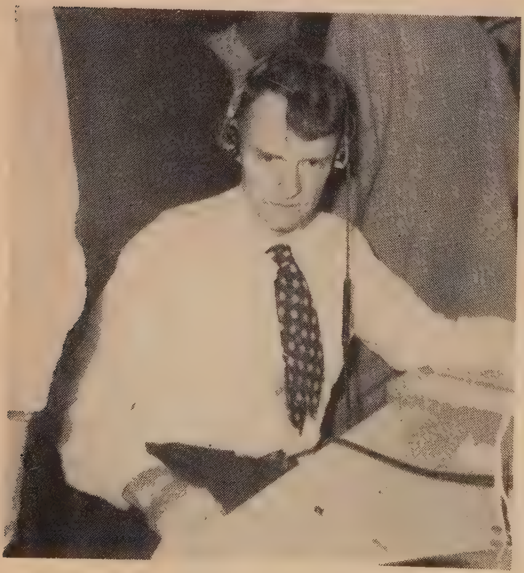
California	147.85	Mc.	AFSK on AM
Chicago, Ill.	147.70	Mc.	AFSK on FM
Detroit, Mich.	147.30	Mc.	AFSK on FM
Washington, D.C.	147.96	Mc.	AFSK on AM
	147.495	Mc.	AFSK on AM
New York City	147.96	Mc.	AFSK on AM
Livingston, N.J.	146.30	Mc.	AFSK on AM
Buffalo/Niagara	147.50	Mc.	AFK on AM
Boston, Mass.	147.96	Mc.	AFSK on AM
Seattle, Wash.	147.00	Mc.	AFSK on AM
Spokane, Wash.	147.15	Mc.	AFSK on AM

Autostart—FSK. In RTTY history, autostart has been in use with afsk on vhf for more than a decade. Now, Bob Weitbrecht, W9TCJ, ex-W6NRM, has developed and has had in operation since last Fall an autostart system on 80-meter fsk. This, in spite of QRN, QRM, or what have you, has resulted in the reception of messages at W9TCJ without any attention to his printer; in fact even with Bob hundreds of miles away.

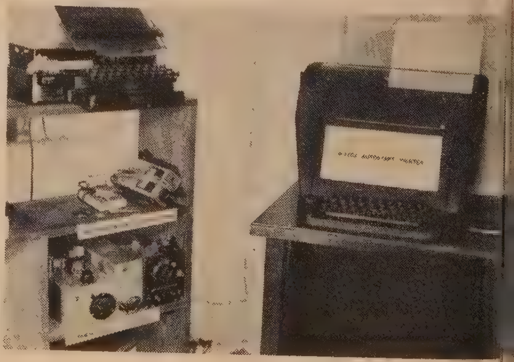
What is this autostart business? For the benefit of the newcomer, autostart is the automatic control, by radio, of distant teleprinter machines. On vhf a certain frequency is monitored, either continuously or at certain times governed by a time clock (CQ, Sept.'55, pg 5
or "programmer." A steady *mark* signal
more than 5 seconds is used to start up th
motor of the distant printer, making it read
to copy any message sent on that channe
When finished, the transmitting station sends
steady *space* signal of more than 5 seconds
shut down all the machines monitoring th
channel. In other words, you don't have to
in the shack to receive a message when yo
have RTTY autostart.

The accompanying photo shows the f
autostart receiving set-up at W9TCJ in W
liams Bay, Wisconsin. It is set up to monitor
certain frequency on either the 80 or 40 met
bands. The equipment has been operating co
tinuously for months, now, turned on 24 hou
a day. Power drain is about 35 watts, whic
comes out to about 2 or 3 cents a day
Williams Bay.

Stability is the important factor in fsk aut
start. The problem of frequency control w
solved by using a BC-453 "Command" receiv
with a crystal controlled converter and by lea
ing it on all day and all night. Bob claims
will stay within 20 or 30 *cycles* for days an
weeks on end. This receiving system was i
spired by Don Stoner, W6TNS, Surplus Edit
and now Novice Editor of *CQ*. (See page 1
Jan.'56 *CQ;* and page 48, Sept.'56 *CQ*)



Bob Weitbrecht, W9TCJ, the "Wizard of Williams Bay."



FSK Autostart at W9TCJ.

THE *New Look* FROM *National* . . .

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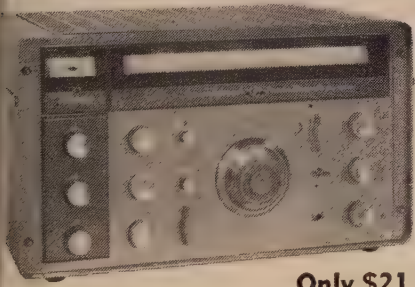
A top-quality, low-cost receiver, directly calibrated for the 4 general coverage ranges and 5 bandspread ranges for the amateur bands (80-10M). Also covers 540 kc. to 40 mc.; voice or CW. Features include calibrated bandspread for 10, 11, 15, 20, 40 and 80M; separate tuning capacitors, knobs and scales for general coverage and bandspread; large easy-to-read 11" slide-rule dial, and front panel "S" meter for signal strength indication and more accurate tuning. Size: 16$\frac{1}{16}$x10x10⅞".

Only $12.96 per mo.

ay $16.00 Down — Cash Price: $159.95

And Another New One Coming in June!

till the Center of Attention . . . *National's NC-300*



Features greatest sensitivity at any price! Greater stability than most receivers. 10 dial scales cover 160 to 1¼M with exclusive converter provision with scales calibrated for 6, 2 and 1¼M, using a special 30-35 mc. tunable IF selector — .5 Kc., 3.5 Kc. and 8 Kc. Provides super selectivity, gives optimum band width for CW, phone, phone net or VHF operation. Separate linear detector for SSB. High speed inertia tuning dial with 40 to 1 ratio. Exclusive optional RF gain provision for best CW results allows independent control of IF gain. Giant "S" meter. Dual conversion. Calibration reset adjustable from front panel. Crystal filter with phasing control and 3-position band width control. First IF freq. — 2215 Kc., second: — 80 Kc. 10 tubes plus regulators and rectifier. Antenna input impedance: 50-300 ohms. Output impedance: 8 ohms. Less speaker.

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500 Watts, CW - Fone
$39.14
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Cash Price: $699.00

Globe Champion 300
300 Watts, CW - Fone
$25.14
per mo.
Cash Price: $449.00

NEW
Globe Scout 680
6-80M, Fone & CW
$8.10
per mo.
Cash Price: $99.95

Globe Chief Kit
90 Watts CW
$5.00
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or $49.95 Cash

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on your __________ (WRL Eqpt. Desired)

C
6/7

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LABORATORIES
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ELECTRONIC
EADQUARTERS
15 W. BROADWAY COUNCIL BLUFFS, IOWA

For further information, check number 25 on page 126.

The transmitting procedure for fsk autostart is as follows:

1—Get on the specified frequency, within 50 cycles. Use 850-cycle shift, *mark* high. Be sure that the channel is clear (of fsk) and that propagation conditions are about right.
2—Transmit 5 seconds of reversals at 60-cps. This starts up the unattended printer.
3—At the conclusion of the "buzzing" interval, return immediately to *mark* and send your message.
4—At the conclusion of the message, transmit five seconds of *space* to shut down the motor.

Simple, isn't it? The "buzzing" signal must be square waves, 60-cycle reversals, very easily obtained from the power line. *Fig. 1* shows the simple circuit of the autostart signal generator. All it takes is a polar relay with a.c. applied to its coils and a couple of push-buttons.

Note the grid dipper and crystals on the shelf above the terminal unit and receiver. These are for the purpose of adjusting and checking the autostart receiver to the desired channel. This is an easy and painless way of getting exactly on frequency. *International* Type FA-9 crystals are used, and they are not too expensive.

In Bob's opinion, the very best way of frequency control and calibration is to use a 100 kc crystal standard, with appropriate multivibrators. Such devices are available at low prices from *International* and deserve to be widely used by frequency-conscious RTTY amateurs. The multivibrators should be set up for 10 kc spots and also additional spots for 2.5 and 2 kc. W9TCJ has such a frequency standard and can zero in on any specified frequency (multiples of 2 or 2.5 kc) in only a few seconds.

Receiving circuitry, or just how the machine is started, will be revealed shortly by Bob, probably in *RTTY*.

International RTTY

CN8FQ, in Sidi Yahia, French Morocco, is now on 20-meter fsk, 14,140 kc, with a Mod 14. Lucky fellows to work his "very sol signal" were W3PYW and W9TCJ.

Bruce, ZL1WB, will soon be on 11-meter fs around 27,000 kc. Bruce recently got son toroids and reports very satisfactory results wi them. R. J. Sykes, ZL1AHO, in Papakura, also interested in RTTY and is looking for machine down there.

VP4LD, Trinidad, suddenly found himse responsible for teleprinter maintenance whe he works. (This is a better excuse than I hav ever used to borrow a machine to check o on 20-meters!)

Across the Nation

W8GDQ, in Wellington, Ohio, found brand-new Olivetti (Italian) teleprinter ma chine, and is wondering whether or not he ca use it on RTTY. W8MGQ of Detroit has a FRA converter to use with his 75A3 and Mode 26. George also has some FM gear to use o the Detroit 2-meter autostart channel. All h needs is a little time to get things going. (Thi I can really appreciate!)

W7ZEV, ex-W0BOL, of Seattle, found in th local surplus market afsk gear from the ol Alaska Communication System and is won dering what to do with the odd (to ham RTTY collection of audio frequencies.

W2VLL reports a recent visit by W6AEE t the Buffalo/Niagara gang. Merrill was picke up at the Buffalo airport by W2RUI Marc 30th and was taken to dinner and Lockpor Most of the Northwestern New York RTT gang met him that evening at the Lockpo Amateur Radio Club and later in the shac of W2RUI.

W2RGO is a new station on 3620 kc fro Niagara Falls with 400 watts. W4OVS is i Battey Hospital in Rome, Georgia. Neal i interested in tuning fork oscillators. K2DFF Hazlet, New Jersey, is just about ready for 2 meter afsk with his Model 26 and W2PA terminal unit.

W2GHH, K2CSI, and K2LBJ, all in subur

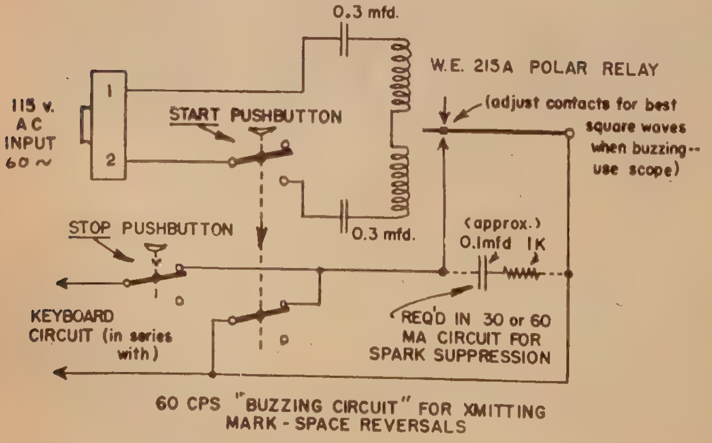
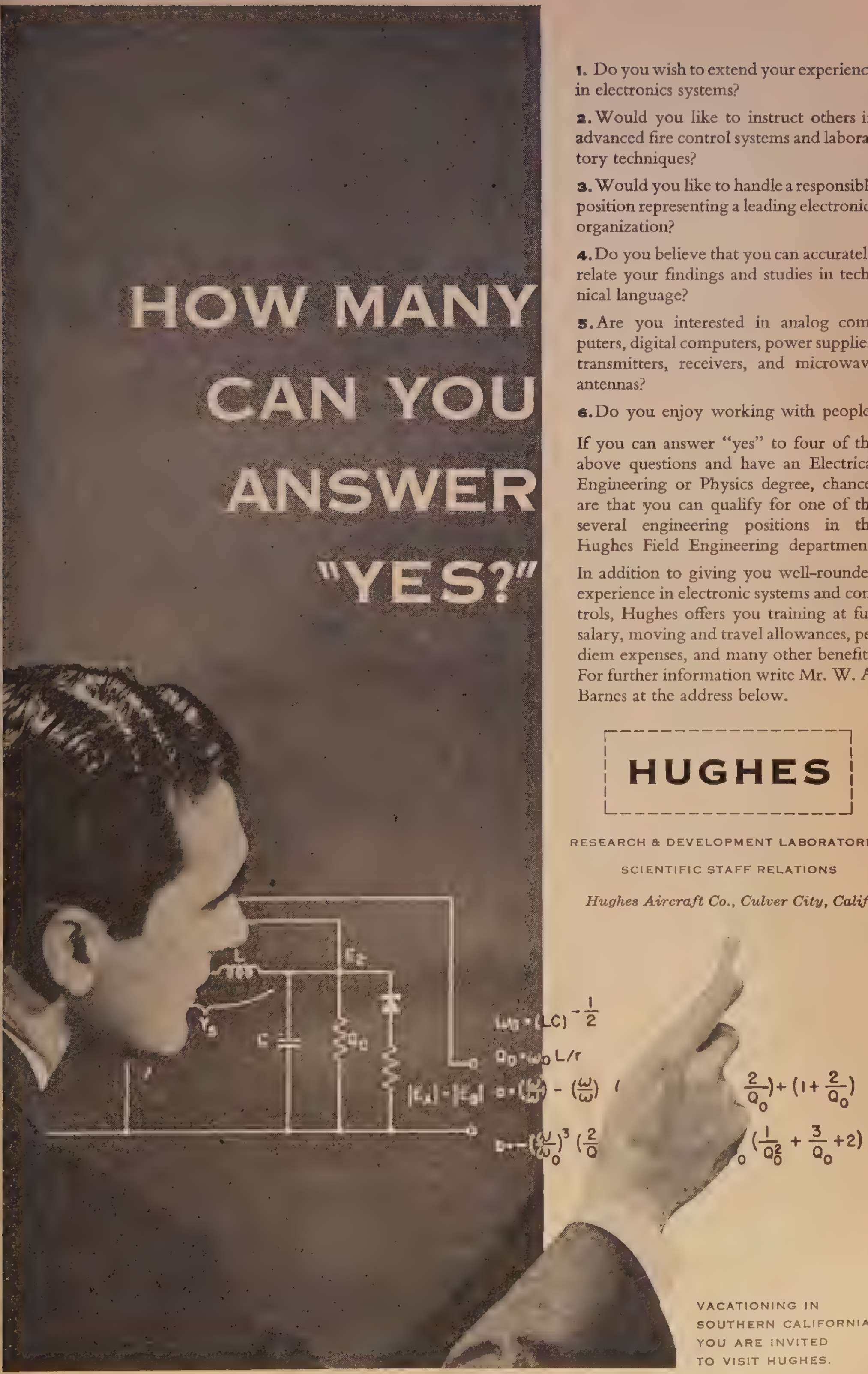

0.3 mfd.
W.E. 215A POLAR RELAY
115 v. AC INPUT 60 ~
1
2
START PUSHBUTTON
(adjust contacts for best square waves when buzzing-- use scope)
STOP PUSHBUTTON
0.3 mfd.
(approx.) 0.1mfd
1K
KEYBOARD CIRCUIT (in series with)
REQ'D IN 30 or 60 MA CIRCUIT FOR SPARK SUPPRESSION
60 CPS "BUZZING CIRCUIT" FOR XMITTING MARK - SPACE REVERSALS

Fig 1—FSK Autostart Signal Gene ator. Optional: 6.3. v. AC into re lay coils through 200 Ω


HOW MANY CAN YOU ANSWER "YES?"
L
E2
C
Q0
Ys
|E1| - |E0|
$\omega_0 = (LC)^{-\frac{1}{2}}$
$Q_0 = \omega_0 L/r$
$\frac{2}{Q_0}) + (1 + \frac{2}{Q_0})$
$(\frac{1}{Q_0^2} + \frac{3}{Q_0} + 2)$

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ban Westchester County, are breathing life into the New York City area 2-meter RTTY channel. Also active are W2PEE in Glen Head, Long Island, and W2JTP.

Things to Come

Several interesting papers have been submitted to *CQ* through your RTTY Editor recently. All, of course will not necessarily be published as separate articles (There are other phases of amateur radio that *CQ* has to cover, you know), but if not, I will see that you fellows get the information via your RTTY column.

For example, Dave Vanderhoek, W2VLL of Lewiston, New York, has written a very well illustrated piece on the mechanical functions of the Model 26 *Teletype* machine, the machine most used by RTTYers. Many letters have come to your RTTY Editor asking for information on the mechanical operation, cleaning, and adjustment of the Model 26. This kind of article has been needed a long time as not too many service manuals are in circulation.

Also, H. F. Lund, W9KQL, Trustee for the Sangamon Valley Radio Club, Springfield, Illinois, has submitted a rather complete paper on an RTTY keyer for use with the *Collins* KWS-1 SSB transmitter. According to W9KQL, this keyer was especially designed to, ". . . . help the gang keep their fingers out of the PTO!" Actually, the keyer is an extremely simple device used to insert an afsk signal into the modulator of the KWS-1. The transmitter, in the SSB position, then puts out an fsk signal.

Dick Wells, W2ORX, of Livingston, New Jersey, reports on a very interesting project by W2NRQ, W2ICA, and W2ORX. These Livingston RTTYers are at present operating an autostart net or "order-wire" RTTY circuit on 2-meters. Continuous monitoring of the channel is the system used, so no timing devices are needed. Simple relay control circuits, actuated by selector magnet current derived from the afsk converter, are used to start and stop the printer motors.

The most interesting development of the Livingston RTTY project is the method by which they transmit RTTY. This is a single-sideband transmitter keyed by the standard afsk tones, 2125 and 2975 cycles, to produce afsk (SSB or DSB) by including carrier; or fsk by rejecting carrier. Heterodyne frequency changers permit signals to be transmitted on *any* amateur band.

Jack Pitts, W6CQK/2, of Summit, New Jersey, has designed and built a heterodyne-type of vfo-exciter for fsk and cw. This Jack brought out to High Hills and demonstrated at W2JTP. Details on this fine piece of gear will be featured in your RTTY column in a forthcoming issue of *CQ*.

Comments

Reading the above reports on RTTY activity, you get the distinct impression that these are active minds at work; and extremely interesting work at that. These fellows are not just sitting on their fat laurels and chewing the rag on factory-built rigs. They are thinking, discussing, and trying out new ideas, on the air as well as on the bench.

This is the last frontier of Amateur Radio; the old ham radio, where hams build their own gear. These men are not just short-time hobbyists. If they weren't in the game 20 years ago they will be 20 years hence. Many earn their living in connected fields as the result of learning early via amateur radio how to put their active minds to work, and they are better men for it. This, then, is RTTY.

73, Byron, W2JTP

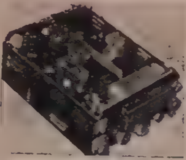
SB [*from page 76*]

mobile rig, and should be satisfactory. It is planned to use three V-beams in addition to the Telrex Beam.

Fifteen is rapidly becoming the most popular band for the DX gang due to the terrific congestion on twenty. Some of the SB signals heard on twenty are from twenty to twenty-five Kc broad, and do very little to prove the advantages of SB to the AM boys. There are very few SB stations which are operated properly, and the time is rapidly approaching when the QRM on twenty top-side will equal the squeals and bedlam that exists on the lower 50 Kc of the band, I wonder how many of you use 2x scopes to monitor your signals? Fellows, take it from one of the most flagrant "needle-benders" before getting religion, that it is not necessary to open up the audio gain to a point where the signal flat-tops to have a 100% QSO. I learned the hard way after nearly losing most of my friends on the bands that a well operated SB station not only sounds good but is just as strong at a distant point as it would be if the gain was opened wide. We are supposed to be the operators of the latest and most efficient type of communication known today. . . . Let's show the world that we are qualified to operate it. . . . 73, Bob, W3SW

Big prize: Guess this QTH.

Ham Special! Famous BC-645 Transceiver



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PE-101C DYNAMOTOR for BC-645, has 12-24V input (easy to convert for 6 V Battery operation only) **$7.95**

UHF ANTENNA ASSEMBLY, for BC-645 .... $2.45

Complete set of 10 Plugs for BC-645 .... **$5.50**

CONTROL BOX for above $2.25
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CONVERSION BOOKLET. Instructions for most useful surplus rigs **$2.50**

SCR-522 FINEST 2-METER RIG!

Terrific buy! VHF Transmitter-Receiver, complete with all components. 100-156 Mc. 4 channels, Xtal-controlled. Amplitude modulated voice. They're going fast! Excellent condition.
SCR-522 Transmitter-Receiver, complete with all 18 tubes. COMBINATION .... Special **$33.33**

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Navy Type Comm. Receiver 1.5 to 3 Mc
BRAND NEW with 6 tubes **$16.95**
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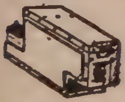
DYNAMOTOR for Above $4.95

LM FREQUENCY METER, 125 to 20,000 Kc. Heterodyne, modulated, crystal calibrated, with calibration book. Excel. Cond. **$49.50**



ARC-5/R28 RECEIVER 2-meter Superhet, 100 to 156 Mc in 4 crystal channels. Complete with 10 tubes.
BRAND NEW **$18.95**
110 V AC power supply kit $9.75

ARC-5/T23 TRANSMITTER companion for above; includes 2-832A and 2-1625 tubes. BRAND NEW, complete with tubes ... $19.95

ARC-5/T23 TRANSMITTER
Excellent used, less tubes **$5.95**
BRAND NEW, less tubes $7.95

ARC5 MODULATOR, type MD7 BRAND NEW $8.95

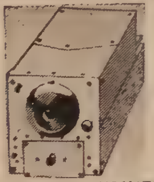
DYNAMOTOR VALUES!

Type	Input	Output	Excellent Used	BRAND NEW
DM-33A	28V 5A 28V 7A	575V .16A 540V .25A	1.95	3.95

DM-32 type Dynamotor, input 12 V @ 2.4A: output 250V @ .060 A. BRAND NEW **$5.95**

SPECIAL BUY FOR MOBILE HAMS

Brand New DYNAMOTOR, Input: 14 V @ 2.8 A., Output 220 V. @ .080 A. Filter in base. Complete with shock mount and spare brushes **$7.95**



R24-ARC/5 NAVY TYPE
(Similar to BC-946)

BROADCAST RECEIVER

520 to 1500 Kc. 6 tubes: 3—12SK7, 12SR7, 12A6, 12K8. For dynamotor operation. Easily converted to 110 or 32 Volt. 2—IF stages, 3-gang tuning cond. Complete with all tubes, in original sealed carton.
BRAND NEW **$19.95**

BC-457 TRANSMITTER—4-5.3 Mc, complete with all tubes and crystal. BRAND NEW **$7.88**

BC-458 TRANSMITTER—5.3 to 7 Mc, complete with all tubes and crystal. BRAND NEW **$7.88**

BC-459 TRANSMITTER—7-9.1 Mc, complete with all tubes and crystal. BRAND NEW **$11.95**

ARC-5/T-19 TRANSMITTER—3 to 4 Mc. BRAND NEW, complete with all tubes & crystal **$8.88**

SCR-274 COMMAND EQUIPMENT

ALL COMPLETE WITH TUBES

Type	Description	Used	Excellent Used	Brand NEW
BC-453	Receiver 190-550 KC	$10.95	$11.95	$14.95
BC-454	Receiver 3-6 Mc	7.19	8.29	11.95
BC-455	Receiver 6-9 Mc	5.25	7.95	9.95
BC-456	Modulator	2.24	2.75	4.24

110-VOLT AC POWER SUPPLY KIT

FOR ALL 274-N and ARC-5 RECEIVERS

Can be assembled quickly and easily, on pre-drilled chassis. Plugs into the rear of any model 274-N receiver and delivers 24 volts as well as "B" voltage. No wiring charges needed. Complete kit of parts with metal case, Instructions **$7.95**
Wired, Tested, Ready to Operate $11.50

SPLINED TUNING KNOB for 274-N RECEIVERS. Fits BC-453 BC-454 and others. Only **49c**

JUST RECEIVED! ASB-5 'SCOPE INDICATOR

BRAND NEW, including all tubes, together with 5BP1 'Scope Tube. Originally used in Navy Aircraft Radar Equipment. Easily converted for AC operation. Value $250.00!
OUR LOW PRICE **$15.95**

ASB-5 RECEIVER for 420 Mc BAND!

As featured in "CQ" for October 1956. Easily converted, makes a marvelous receiver for 420 band, with RF Amplifier! Supplied complete with all tubes,
OUR LOW PRICE **$14.95**
Tuning Knob for ASB-5 Receiver $1.29

OPERATING MANUAL for ASB-5 Indicator and Receiver listed above **$1.95**

BRAND NEW SPECIAL PURPOSE TUBES

in Original Individual Packing

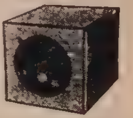
JAN CRP-730A MAGNETRON, Raytheon $3.45

Type	Each	Lots of 12	Lots of 100
6J6W	$.45	$5.15	$41.00
1625	.26	2.75	21.50
1626	16	1.75	13.50
1629	.27	3.05	23.95
826	.44	4.95	39.50
2J724B	.35	3.95	29.50
VR105	.79	8.88	70.00
VR150	.79	8.88	70.00
8002R	5.95	....	....
RK65	7.25	....	....

NEW! Cathode Ray Tubes NEW!

3CP1 .... $1.18
3FP7 .... 1.18
5BP1 .... 2.22
5BP4 .... $2.22
5CP1 .... 2.45
9LP7 .... 1.88

DETROLA BEACON RECEIVER BC-1206A



A dandy little receiver for 200 to 400 Kc band. Uses 135 Kc iron core IF's. Complete with six tubes: 6SK7, 6SA7, 6K7, 6SQ7, 2-25L6s. Used **$4.99**

DYNAMIC HANDMIKE with "Press-to-talk" Switch, cord and plug—**BRAND NEW** .... only **$2.95**

FAMOUS BRAND HI-FI DYNAMIC HEADSET WITH LARGE RUBER EARCUSHIONS

Freq. Range: 40-14,000 CPS. No distortion.
BRAND NEW. Value $45.00 .... **$7.95**

CD-307A Cords, with PL55 plug and JK26 Jack .... .99

DYNAMIC HEADPHONES, 600-ohm impedance, with large earphone cushions, cord and phone plug.
BRAND NEW, special **$3.95**

AN/ARR-2 RECEIVER

BRAND NEW — A Terrific Value! Tuning Range 234 to 258 MC. Tubes: 7-9001, 3-6AK5, 1-12A6. Only a few at this low price! **$8.88**
Complete ....

With 28V 1.6A Dynamotor, complete $12.98

110 VOLT AC POWER SUPPLY KIT for above $9.75

BEAM FILTER (Navy Type) BRAND NEW, complete with 3-ft. cord and PL-55 Plug **$1.88**

FL8-A RADIO FILTER $1.79

2 VOLT BATTERY "PACKAGE"

1—2V. 20 Amp. Hr. Willard Storage Battery $2.75
1—2V. 7 prong Synchronous Plug-in Vibrator 1.49
1—Quart Bottle Electrolyte (for 2 cells) 1.45

ALL BRAND NEW!
Combination Price **$4.99**

Please include 25% Deposit with order — Balance C.O.D. 50¢ HANDLING CHARGE on Orders under $3.00 MINIMUM. All Shipments F.O.B. Our Warehouse N.Y.C.

G & G Radio Supply Co.
Telephone: CO 7-4605
53 Vesey St., New York 7, N. Y.

For further information, check number 27 on page 126.

Editorial . . . *from page 10*

dipole in a matter of minutes and work out quite well. Cut it about 17′-3″ long for 27 mc. The band goes from 26.96 mc to 27.23 mc, in case you're not sure where it is. The contest is open to any amateur station in the world and starts at 0800 EDT (1400 GMT) June 8th and ends at 2000 EDT June 9th. Contacts within the same state count 1 point, with other states 2 points, and with other countries 3 points. Contacts will consist of an exchange of call letters and state or country. Logs will also carry the time and date of the contact for cross-checking purposes.

Send all logs to CQ Magazine, 300 West 43rd Street, New York 36, New York immediately after the contest. This is one case where it is of the utmost importance to send in your log, no matter how few contacts you have made. We will then determine how many stations were active in the contest, give the proper VIP treatment to the winners in each state and country and have a big pile of logs of eleven meter stations to take down to the FCC as an exhibit.

Please George Jacobs, give us some decent propagation conditions for that weekend.

It's Up To You

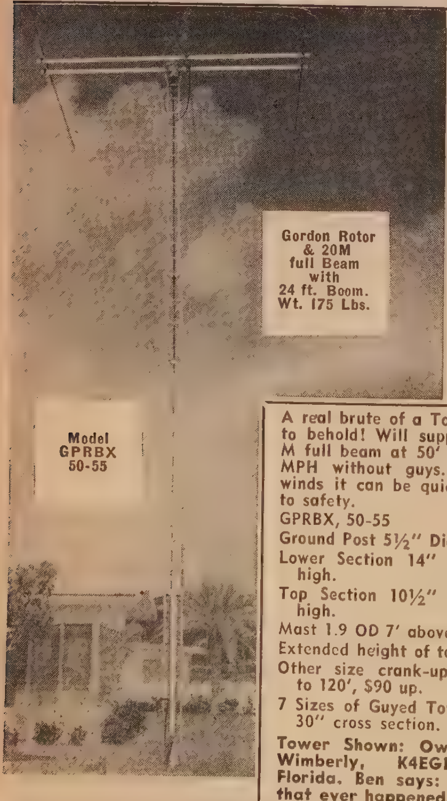
I'll do everything I can to help, but I'm only one fellow sitting at a typewriter in Brooklyn, so the bulk of the work is up to you. Here is a chance to stand up and be counted. We'll find out who our friends are anyway.

The call of every station that sends in a log will be published in an early issue of CQ so all of us will be able to see who actually was willing to *do* something to help ham radio. This is one time when every amateur (this includes *you*) should make it his personal responsibility to give a little time to keeping our hobby strong. Don't look to anyone else to help you on this, bub . . . it is all up to *you*. Get that letter into the FCC today (in triplicate to: Docket 11994, FCC, Washington 25, D.C.), get on eleven meters June 8-9, and send in your log. If you can stand just a bit of extra duty then get your friends to do the same.

Attention DX Readers

I am still getting an occasional letter complaining that we use the term "B & W #3013 coil" or "Air Dux #804T coil" and the DX reader has no way of knowing what that is all about. Absolute rot. I have an excuse, flimsey perhaps, but iron clad over all. Just you chaps look back at page 21 in the November, 1956 CQ and you will see a complete list of the B & W and Air Dux coils, complete with all the specs. So let's not have any more of that sort of complaint, eh?

[*More on page 108*]



HEAVY DUTY STEEL TOWERS
Built Especially for Ham Beams

(Not just another TV Tower)

- CRANKS UP AND DOWN—TILTS OVER
- 25 DIFFERENT TYPES—40′ TO 60′
- FREE STANDING—NO GUY WIRES—NO CONCRETE
- 80′—100′—120′ CRANK-UP, TILT-OVER TOWERS (THESE MUST BE GUYED)

A real brute of a Tower—yet a beauty to behold! Will support a 4 elem. 20 M full beam at 50′ in winds up to 70 MPH without guys. In case of high winds it can be quickly cranked down to safety.

GPRBX, 50-55
Ground Post 5½″ Dia. 10″ high.
Lower Section 14″ cross section, 31′ high.
Top Section 10½″ cross section, 21′ high.
Mast 1.9 OD 7′ above tower.
Extended height of tower 48′.
Other size crank-up towers from 40′ to 120′, $90 up.
7 Sizes of Guyed Towers from 6½″ to 30″ cross section.

Tower Shown: Owned by W. Ben Wimberly, K4EGE, Clearwater, Florida. Ben says: "Greatest thing that ever happened to Ham Radio."

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E-Z WAY TOWERS
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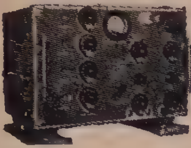
Send me your FREE catalogue on the following towers:
☐ AM Radio ☐ Television
☐ Ham Radio ☐ Two-Way Communication
I am interested in a tower.......................ft. high.
I will use a...antenna.
(State type and model)
Type of Rotor ....
Name ....
Address ....
City ....State ....

E-Z WAY TOWERS Inc.
P. O. Box 5491 • Tampa, Fla

For further information, check number 50 on page 126.

BENDIX 100 WATT TRANSMITTER!

FOUR SEPARATE ELECTRON-COUPLED OSCILLATORS!



Can be easily converted to 10-20-40-80 meters. Crystal required for 10 meters. Each electron-coupled oscillator dial has 3,000 divisions enabling quick, precision shifting. Constructed of highest quality parts with laboratory precision. Four separate output tanks; one 4-position selector channel switch has seven sections which change the ECO, IPA and output tanks **simultaneously!** ALL controls mounted on front panel. The housing is cast aluminum, shields and case are sheet aluminum. 11" x 12" x 15". Ship. wt. 45 lbs. Complete with instructions and schematic. Uses and includes 3—807's and 4—12SK7's. Has 2-inch 5-amp R.F. output meter.

Only one knob (center) selects 10-20-40-80 meter bands. A complete coverage transmitter, for the new or experienced amateur. A TRUE HAM VALUE—COMPLETE WITH TUBES. Excellent condition. Cat. 3861TX15............ **$27.50**

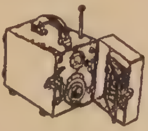
TEST SCOPE — MOD. MONITOR — TTY

BC-929: compact display unit with 3BP1 plus 7 receiving-type tubes; hi-voltage divider from -1600 v. with intens., focus, and positioning controls; plus a very useful DPDT motor driven switch. BC-929 is the TTY ham's favorite foundation for converter with cross-line scope presentation; also the favorite for modulation monitor. Compact and light. Only 22½ lbs. You get the unit in excellent condition, with all tubes, **plus** the original schematic with parts values and circuit functions, **plus** conversion instructions to 3" test scope with converted schematic, **plus** schematic of a mod. monitor using a 2" tube, applicable to the 3BP1 with slight HV increase. Ship wt. 30 lbs. Only **$12.95**

RECEIVE ANY BAND 15-500 MC. CHECK YOUR BAND WIDTH

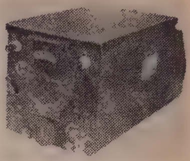
TS-92/AP is a special superheterodyne receiver, using xtal mixer, low-pass filter, and then regular 6-tube superhet circuit with output to panel meter. Comes with antenna probe, loop probe, cords, filter **F-17/AP,** and spare crystals. Tuning range 15 to 500 mc with dial calibration accurate to 0.125 mc. Bandwidth received is adjustable from 0.5 to 7 mc. Selectivity: —3db when off 50 kc. Purpose: to check and align RF amplifiers. Excellent condition, has 115 v. 60 cy. power supply, and only.............. **$17.95**

FREQUENCY METER BARGAIN



BC906 is also a wonderful **Grid Dip Meter** and **Relative Field Strength Meter!** Frequency 144-225 mc. covers VHF communications and upper TV channels. You tune a silver-plated cavity to resonance with a large National Velvet Vernier dial. A probe in the cavity feeds the diode plate of a 1S5 and the rectified negative voltage applied to the grid of the same tube dips the plate current as shown on a 0-500 dc microammeter. The dial is individually calibrated with a curve showing 100 kc per dial division. The entire unit is in a compact carrying case only 12½ x 8¾ x 6½" with a leather handle. Schematic is pasted inside. Includes plug-in antenna. Specs inside for one ea. 1.5 V. and 15 V batteries. This precision laboratory device is in excellent condition **$7.95**

7 TO 27 MC SUPERHET RECEIVER BARGAIN



Spreads out into 5 big bands to give easy readable vernier-cranked tuning. This is the Navy Air Force's famous RAX Unit 3. **TWO** 12SK7 tuned RF amplifiers, 12K8 converter, **THREE** 12SK7 2,275 mc IF's, 12SR7 BFO & 2nd det., 12A6 output. 40-Meter & 20-Meter Amateur bands, commercial TTY bands, high-seas, Airline, foreign short wave—you get them all! No sweat to change 2 of the heads to 80 and 10. We furnish large chematic with parts lists and alignment frequencies. Units are in excellent condition, with tubes, and only **$19.95**

.2 to 1.5 mc SUPERHET RECEIVER BARGAIN

Same as above except freq. 200-1500 KC. in 4 bands.. .... **$14.95**

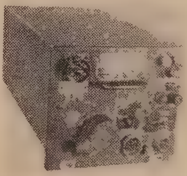
KILL QRM FOR $1.95

Brand new filter made by UTC passes enough each side of 1020 cy to make CW and MCW intelligible, and cuts off everything else! Goes between rcvr output jack and headset. 600 ohms. WHY LIVE WITHOUT IT?

THE HEART OF S-BAND

RT-35/APG-5 (also used in APG-15) cavity assembly. 2400-3000 mc. Includes T-R cavity, xmtr osc cavity, rcvr local osc cavity, and receptacle for the xtal mixer with output of 30 mc. Uses but doesn't include 1B27, 2C43 (or 464-A) 2C40 (or 446-B) and 1N21B in the cavities mentioned respectively. MANUALLY TUNEABLE! Brand new. Priced for experimenters at only **$4.95**

COMMUNICATIONS RECEIVER



RCA's CRV-46151 6-tube superhet 195 Kc thru 9.05 MC. Very sensitive. Includes RF stage. Sharp and broad selectivity. Has AVE-MVC switching and BFO. You may replace the dynamotor with an AC power supply. Dope sheets and schematics included. Excellent cond. Shpg wt. 30 lbs. Cat. No. 3806RE5CQ Only **$19.95**

MOUNTING RACK $2.50

ACCESSORY KIT FOR ABOVE: 2 control boxes, tach shaft, and set of plugs.............. $7.95

---

6 VOLT MULTI-CONTACT RELAY BARGAIN

HAS two sets of SPDT contacts and two pair of SPST Normally Open contacts, H.S. in small can with schematic on the case. In can, weighs 3½ oz. Out of the can, only 1¾ oz. New! Cat. 206RY29-CQ. Only **$1.95**

SEND FOR OUR FREE FLYER ON DYNAMOTORS, METERS, XMITTERS, ETC.

All shpts. FOB whse. Send 25% dep. with all C.O.D. orders. Item sub. to prior sale & change of price without notice. Min. order $2.50.

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Central Mailing Address & Sales-Showroom:
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California Distributors' Stores
G. L. Electronics Inc., 1632 Venice Blvd., Los Angeles
P.A.R.T.S., INC., 8905 San Fernando Rd., Sun Valley

For further information, check number 28 on page 126.

HARVEY has it...

TELREX
'56
Beam
Antennas

Commercial grade arrays at amateur prices; superior in performance, design and construction. Hairpin resonated, precision tuned, matched and calibrated. Provide highest signal-to-noise ratio possible; 75% reduction in precipitation static.

FEATURES

- Extremely rugged elements of advanced sectional design; taper-swaged to reduce useless wind drag and silhouette by 55%.
- Special sturdy molded element support made of Borg-Warner "Cycolac", a very high impact thermoplastic resin; holds, insulates and capacity-couples element to the boom for automatic dissipation of precipitation static.
- Stainless-steel airplane-type clamp, holds element sections firmly in exact position.
- Precisely constructed and the famous Telrex "Balun" help produce outstanding performance per element, clean-cut balanced pattern and minimum TVI.
- Single, heavy-wall aluminum boom is small in size, rugged in strength, and light in weight.

"SERIES 56" SPECIFICATIONS AND PRICES

Telrex No.	Meter Band	Elements No.	Gain db	Shpg. Wt. Lbs.	Amateur Net Each
¾M-15C	¾	15	16.2	13	$ 29.00
1¼M-5C	1¼	5	11.9	3	6.95
1¼M-15C	1¼	15	16.2	16½	31.00
2M-3C	2	3	9.4	2¼	5.95
2M-5C	2	5	10.5	3	7.25
2M-6C	2	6	12.7	4	12.50
2M-8C	2	8	13.5	10	13.75
2M-808†	2	16	10.5	15	33.50
2M-15C	2	15	16.2	28	39.25
6M-3D	6	3	9.4	7	16.25
6M-4C	6	4	9.7	10	19.75
6M-6C	6	6	12.7	20	57.50
6M-56-135§	6	6	12.7	44	149,00
1030-S	10	3	7.0	9	36.50
10M-56-79‡	10	3	8.9	27	96.00
10M-56-120‡	10	4	10.1	33½	144.00
10M-56-185§	10	5	11.2	77	220.00
10M-56-235§	10	6	12.7	93	290.00
15M-56-67‡	15	2	4.8	22	80.00
15M-56-99‡	15	3	8.9	32	117.00
15M-56-118‡	15	4	9.7	37	140.00
15M-56-198§	15	4	11.1	64	235.00
15M-56-245§	15	5	11.9	94	285.00
20M-56-79	20	2	4.8	26	89.00
20M-56-112‡	20	3	8.7	33	130.00
20M-56-149§	20	3	9.0	56	175.00
20M-56-168§	20	3	9.4	63	198.00
20M-56-235§	20	4	10.4	74	275.00
20M-56-265§	20	4	11.2	90	305.00
40M-56-180	40	2	3.4	66	180.00
40M-56-365§	40	3	8.3	130	365.00

†Circular polarized. ‡Deluxe Model. §Super Deluxe Model.

Harvey has in stock the New Tri-Band Antennas for 10-15-20 Meters

MAIL ORDERS SHIPPED SAME DAY AS RECEIVED

Include with payment an allowance for shipping charges. Prices subject to change without notice.

HARVEY RADIO CO., INC.
Estab. 1927
1123 Avenue of the Americas
(6th Ave. at 43rd St.) N.Y. 36, N.Y.
JU 2-1500

For further information, check number 29 on page 126.

More Editorial [*from page 106*]

Docket 11997

Close on the heels of Docket 11994, which proposed the demise of the eleven meter band for us, came 11997 which proposes an inquiry into the allocations of frequencies to the various non-governmental services in the spectrum between 25 mc and 890 mc.

This proceeding is the initial step in considering re-allocations in these bands. Looking further, in Appendix B, I, (g), we find: "Amateur Radio Service" specifically mentioned as one of the services to be investigated. Appendix B asks quite a few questions and requests an answer to them by July 1, 1957. I would suggest (rather strongly) that any clubs or individuals who may have an interest in preserving any of our bands above 25 mc write to the FCC, Washington 25, D.C. and request a copy of Docket 11997. I'm going to check up and see who has submitted comments and try to give you an idea how things are going.

A letter from Bob Bain, W5CRK, enclosing a check to buy a subscription for YU3EU, suggests that I make mention that many of our DX operators cannot possibly afford the price of such an item, it being equal to about three days pay for many of them. If you have any buddies over seas that you would like to favor with a subscription to CQ I will make it easier . . . address the sub to me, personally, and enclose $5 for a year instead of the regular $6. We'll send along a gift subscription card to the chap so he'll finally part with that QSL for you. If you're just overflowing with the milk of human kindness then send along some multiple of $5 and we will pick out some of the really needy DX'ers to get the magazine. 2:53, Wayne

Visiting London?

Frank Fletcher G2FUX emphasizes that all visitors are very welcomed by the London Members Club which meets at the Bedford Corner Hotel, Bayley Street, Tottenham Court Road, London W.C. 1. usually on the third Friday of the month. They gather in the bar at around 12:30 and lunch at 1 p.m. Phone Frank at Ruislip 2763 or the RSBG at HOLborn 7373 for details of the next meeting. The group has entertained over 30 visitors from 17 countries during the last year and hopes eventually for DXCC and WAS.

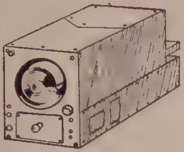
Uniontown Gabfest

The Uniontown (Pa.) Amateur Radio Club will hold its Eighth Annual Gabfest on June 29th at the Club House on Old Pittsburgh Road, on Route 51, two miles north of Uniontown, Pa. Prizes, refreshments, movies . . . starting at noon. This is a STAG affair. Registration $1.50. Uniontown A.R.C., Box 849, Uniontown, Pa.

SAVE!...BARGAINS GALORE!...SAVE!

NEW LOW PRICES! — EFFECTIVE JUNE 1st

COMMAND TRANSMITTERS & RECEIVERS



ARC-5 and SCR274 as available

BC 455

XLNT... $5.95

Depot Repacks... $7.95

Receivers, w/o dynamotors

R-25 Marine, 1.5-3 MC, new	$10.95
R-26 or BC-454, 3-6 MC, used $6.95. New	7.95
R-27 or BC-455, 6-9.1 Mc, used $5.95. Depot Repacks	7.95
R-28, 100-156 MC, Exlt	13.95
R-4/ARR-2, 234-258 MC, as is w/o tubes, $2.95, w/tubes, used	4.95

Transmitters, w/o modulator or dynamotor

T-18 Marine, 2.1-3 Mc, as is, w/tubes, 3.95, used 4.95, boxed	7.95
T-19 or BC-696, 3-4 Mc, as is, w/tubes, 6.95, used 7.95, new	8.95
T-20 or BC-457, 4-5.3 Mc, as is w/tubes, 2.95, used 3.95 boxed	5.95
T-21 or BC458, 5.3-7 Mc, as is, w/tubes, 2.95, used 3.95, boxed by depot	4.95
T-22 or BC-459, 7-9.1 Mc, as is, w/tubes 3.95, used 5.95, boxed	8.95
T-23, 100-156 Mc, xmitter used, 13.95, xlnt	14.95
Special—1 R-28 Rec. & 1 T-23 xmitter both	25.95

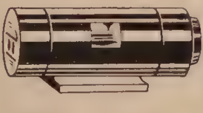
Misc. Command Equipment as available

Receiver dynamotors 28V, used	$ 1.00
BC-456 SC Mod. w/tubes, new 4.95, used	3.95
MD-7 ARC-5 Pl Mod w/tubes less dyn. Xlnt	8.95
28 v dynamotors for above unit	3.00
3-Rec. Rack, used 1.49, new	2.49
New 2-Trans. Rack	2.95
New 24V Trans. 1A	3.50
Plugs for rear of receiver	1.00

110 VAC power supply for ARC-5 & 274N Recvrs kit 8.95, Wired & tested	12.85
Receiver Conversion kit: cont. schematic, BFO Sw, 25 K Pot. phone jack and knob, with instructions	1.95
1625 Tubes, for trans # mod, 50¢	3/1.00

Popular Dynamotor Specials

DM-34 Recvr. Dyna, 12 V in 220 @ 80 ma Out, new	4.95
DM 36 Same as above, 28 V. new	4.95
either of above, used	3.95



PE-101C Dynamotor, 12 or 24 v input, 500 v at 200 Ma out, (300 v 6v in) new	10.95
DM-42, 12 V in. out 1000 and 500, ea at 215 Ma. used	12.95
DM-35, 12V in. 600 at 200 Ma out. Like New	12.95
Wincharger Dyna. 12 v in 440 @ 220 MA Out, new	12.95
BD-69 Rec. Dyna. 14 v in, 220 at 80 MA out, new	9.95
PE-73, 24 v in 1000 at 350 Ma. out. New 8.95, used	6.95
PE-94, 28 v in for 522, 300 at 250 Ma, 150 bias, and 12 V 10 A, new	4.95

"CITIZEN'S BAND!"

420-465 MC. TRANSCEIVER. This is the famous APN-1. In excellent condition, complete but less tubes. Just remove the wobulator (which alone is worth $2.50!) and add a sweep generator. Special! This month only... **$2.95**

12 V Heavy Duty Solenoid. New	$ 1.49
5763 Tube. New	$1.25 ea. 3 for $3.50
815 Tubes. New	$1.49 ea. 2 for $2.75
826 Tubes. New	89¢ ea. 3 for $2.00
BC-654 Transceiver: 3800 to 5800 KC	Used: 34.95

Cathode Ray Tubes

5HP4 or 5CP1.	New 1.98
7BP7	New 2.98

WESTON—SANGAMO—YOUR CHOICE

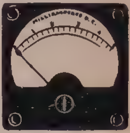
METERS. ALL NEW 2" SQUARE

0-2 Ma
0-5 Ma
0-15 Ma
0-50 Ma
0-100 Ma
0-200 Ma
0-300 Ma
0-500 Ma
0-20 VDC
0-40 VDC
0-300 VDC

$3.29 ea.

SPECIAL

3 for $9.00



Heavy Duty Collins choke 4 Hy-300 Ma can take 500 Ma peaks. new	3.95
Bantam 1-watter, BC-746 plug-in transmitter tuning unit from **WALKIE TALKIE.** 140 mmfd APC type variable cond. plus assorted parts including chassis. Builds into low power transmitter (See CQ March '54)	**New, $1.29**

COIL CONDENSERS

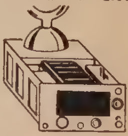
2 mfd 5000 vdc new	$5.95	8 mfd 600 vdc new	1.49
2 mfd 1000 vdc new	1.95	4 mfd 600 vdc new	3 for 1.00
10 mfd 600 vdc new	1.49	2 mfd 600 vdc new	3 for 59¢

Mobile Microphones, newly assembled, W.E. D173015 similar to the TC-128, push-to-talk switch, 3 cond. 5' curl, cord, new	**$3.95**
Chest Mike T-26 w/F1 Button. New	$1.49
F-1 Carbon Mike Element	59¢
RT-48A/TPX-4 IFF Trans-receiver 157-167MC. Complete with Tubes, used, xlnt. Makes nice 2 Meter Rig	$12.95
BC 655 Signal Generator Range 17.5 to 160 Mc. good for T.V. set alignment, use as transmitter fre. checker, built in 0-200 Ua. Triplett 2" round Meter. New	$19.95
Brand New Headphones, HS-23, 2000 ohms, $3.95. HS-33, 600 ohms, complete with brand new rubber cushions	**$4.95**
New small cushions, pr.	.49
Used chamois cushions, pr.	.49
New lg rubber cushions, pr.	.29

Brand new Impedance matching transformer, plug in, 2000 ohms to 600 ohms, takes std plug, boxed 69¢ each, 3 for	**$1.95**
CD-307A cords, has JK-26 on one end for phones, std plug other end brand new, boxed	**$ .97**
Stewart Warner Ammeter, 60-0-60 Amps, brand new, 95¢, 6 for	5.00
Phone-CW Filters, 1020 cycles, new, FL-5, 69¢ FL-8 with switch	1.89
GP-7 transmitter with all tubes less 803 tube and 80 meter coil unit only	13.95
less tubes and coil unit	7.95
TU-7, 4.5-6.2 MC; **TU-8**, 6.2-7.7 Mc; **TU-9**, 7.7-10 MC; **TU-10**, 10-12.5 MC; **TU-26**, 200-500 Kc, choice, used, for BC-375 transmitter, each	2.29
T-30 Throat Mikes, used, 5 for	1.00
3' Mast Sections, MS-49 thru 52, 50¢ each. 53 and above, 75¢ each. Special 1 each MS-49 thru 54, makes 18' vertical	2.95

MN-26C direction finding Equipment

MN-26C Receiver w. dyna	10.95
MN-20E Loop	4.95
MN-52H Az Cont Box	2.95
All above new, special, 1 each for	17.95
Antenna Insulators, Bendix MT-48C, plated end caps, new 15¢ ea., 10 for	1.25
Control Box w/5 Ma S meter, special	1.98



SCR-522, exc. condition. Contains Receiver, Transmitter, Modulator, tubes, tunes 100-156 MC, covers 2 m w/o modification	29.50
New transmitters, GF-11 for 12 volts, or GF 12 for 24 volts, with tubes and built in modulator—less tuning unit, GF-11 $8.95 ... GF-12	8.85
BC-223 Xmitter New With all Tuning Units	29.50
Used W/One Tuning Unit	18.95
BC-434 Control Box W/5 Ma "S" Meter Used	1.95
T S-24/ARR-2—Calibration Test Set for R-3/ARR-2 Receiver New	8.95

TG34 or TG10, 1 Hour Code Tapes

No. 10, No. 13	**New, ea. 1.25**

2.00 Minimum Order. All prices Subject to Change without Notice. Canada & Mexico minimum 10.00. Cash with Order. Sorry, no COD. California Orders Include 4% tax. Prices FOB Los Angeles.

SAM'S SURPLUS, 1306 Bond St., Los Angeles 15, California

For further information, check number 30 on page 126.

KITS! "TAB" KITS!

Each "TAB" Kit Contains The Finest Selection

25 Precision Resistors
10 Switches
25 Knobs
75 Carbon Resistors*
36 Panel Lamps
10 Electrolytic Cond's
15 Volume Controls
25 Tube Sockets
50 Tubular Condensers
500 Lugs & Eyelets*
10 Bathtub Oil Cond's
5 lbs. Surprise Package
10 Transmit Mica Cond's
4 Ceramic Insulators
25 Power Resistors
65 Mica Condensers
5 Crystal Diodes
250 Ft. Hook Up Wire, Asst'd
100 Fuses Assorted
35 Ceramic Condensers
10 Rotary Switches
6 Piezo Xtals & Holders
60 Inductors & Coils
5 Microswitches
10 Wheat Lamps
*In Plastic Box

Order Ten Kits
We Ship Eleven!!!

EACH KIT ONLY . . . 99c

Every Kit Sold On "TAB" Money Back Guarantee!

ARC/5 274N EQUIPMENT SPECIALS!

BC457 As Is $1.39
BC458 As Is $1.98
AN-ARR2/RCVR As Is $1.89
BC457/4 to 5.3 Tested $3.95
BC458/5.3 to 7 Tested $4.95
ARC5/T19/3 to 4 Tested $6.89

We Buy! Sell & Swap As Well!!!
Tubes! Tubes Wanted Top $$$ Paid!

SPECIAL CHOKE CH1001 desgnd W.E. 4 Ey @ 450 ma @ 27 ohms H'Sealed K.V. Insul. Size: 4-9/32x3-7/16x4-13/16 10 lbs. SPECIAL $4 each, 3 for $10, 9 for $27

DYNAMOTOR SPECIAL! LIMITED QUANTITY

6V DC Input: 425 VDC @ 375 MA New & Tested $6 ea., 2 for $10

TUBES "TAB" TESTED *Guaranteed* OUR 12th YEAR IN BUSINESS

0A2	.80	5R4	1.00	6Y6	.89	810	10.00
0A3	.90	5U4	.59	6X4	3/$1	811	3.00
0B2	.72	5V4	.89	7C4	.69	812	3.00
0C3	.84	5Y3	.59	10Y	1.00	813	8.00
0D3	.80	6A7	1.00	12A6	.59	814	3.00
0Z4	.50	6A8	1.00	12AT7	.89	815	2.00
1B3	.78	6AB4	.59	12AU7	.69	826	2/$1
1L4	.82	6AC7	.79	12AX7	.79	828	8.00
1R4	.88	6AG5	.69	12SK7	75	829B	8.00
1R5	.78	6AG7	.89	12SL7	.79	832A	6.00
1S4	.78	6AU6	.59	12SN7	.69	837	1.35
1S5	.68	6AJ5	1.00	12SQ7	.69	866A	1.20
2C22	20/1.	6AK5	.69	24G	2.00	954	10/$1
2C39A	11.00	6AK6	.69	25L6	.72	955	3/$1
2C40	7.00	6AL5	.59	25T	4.00	956	3/$1
2C43	8.00	6AQ5	.66	25Z5	.72	957	4/$1
2C46	5.00	6AS7	3.00	28D7	.80	958A	2/$1
2C51	3.00	6AT6	2/$1	35T	4.00	959	1.00
2D21	.68	6BA6	.59	50L6	.69	991	5/$1
2E22	2.00	6BA7	1.00	HK54	4.00	1619	4/$1
2E24	3.00	6BE6	.59	T55	9.00	1625	.35
2E25	7.00	6BG6	1.50	RK20	5.00	1626	5/$1
2E26	3.00	6BK7	1.00	RK38	4.00	1629	7/$1
2E30	2.00	6BQ7	1.00	RK47	3.00	1851	2.00
2V3	2/$1	6BZ7	1.25	H69	4.00	5654	1.00
2X2	2/$1	6C4	2/$1	75TL	15.00	5670	1.00
3A5	.68	6C5	.69	100T	6.00	6146	4.00
3C24	2.00	6CB6	.80	203A	2.00	6550	4.00
3E29	9.00	6CL6	1.10	211	.49	7193	20/$1
3Q4	.68	6H6	.59	233A	1.00	3AP1A	6.50
3Q5	.86	6J4	1.72	250T	20.00	3BP1	1.90
3D23	5.00	6J5	.59	254	10.00	3DP1A	6.80
4-65A	15.00	6J6	.59	388A	1.00	3EP1	1.00
4-125	32.00	6K8	1.00	434A	2.00	3KP1	7.00
4-250	35.00	6L6	1.00	450T	43.00	5AP1	2.95
4E27	7.00	6SA7	.69	717A	4/$1	5BP7A	25.00
4PR60	35.00	6SJ7	.69	801	4/$1	5CP1A	6.50
4X150	19.00	6SK7	.72	802	2.00	5FP4A	3.00
4X250	35.00	6SL7	.89	805	6.00	5JP1A	14.95
4X500	43.00	6SN7	.72	807	1.19	5JP1	8.95
5BP1	1.00	6U8	1.00	808	1.00	5JP7A	18.00
5BP4	1.00	6V6T	1.00	809	3.00	5LP7A	23.00

TRANSFORMERS: *PRIMARIES 115V, 60 cycles, 1Ø.*

TYPE TPF51 RCA H'Sealed Pwr&Fil Transf 1100VCT @ 200 ma, 6.4V@8A,5V@3A & 125V@200ma, 5H7L6"W SPECIAL!!! $7.95 ea., 2 for $12
TP501 Pwr 24V @ 8A Tap @ 6.3V wgt 5 lbs. $5, 2 for $9
TPF52 Pwr & Fil 778VCT @ 200 ma. 5V @ 3A, 6.3 VCT @ 5A Uprt dbl shell 4½x3¾x4½ H $4, 3/$11
TPF53 Pwr & Fil. 270VCT @ 50 ma, 6.3V @ 2A ea $2, 4/$7
TPF54 P & F 150V @ 30 ma, 6.3V @ 1A,, $1.49, 3/$4

CHOKE W. E. 8Hy @ 400ma, $5 ea., 2 for $9
CHOKE RCA 10Hy/150ma/H'sld, $2 ea., 3/$5
MILLER 2.5 mh/2.5 & 5mtr CHOKES 12 for $1
LINE FILTERS 10A/130VAC DC/.1 to 1 Kmc's $1 ea.
NATIONAL R300/1mh/300ma RF CHOKE 4 for $1
WESTON RFmtr/3½"/120ma/3½", $14 ea., 2 for $24
RF METER 475ma & 5Amps/3½"/GE $5 ea., 2/$9
METER 800ma/3½"/2% Accy/B'KLT CSD $3 ea., 2/$5
MINIATURE PRECISION MTR/ma/2% Accy/Rd/SQ $4 ea., 2/$7
Cool that Tube or Equipment MIN-FAN AC input 6 & 12VAC operation. BARCOL mfgr. $1.89 ea, 3 for $5
ADVANCE RELAY 12VDC/4PDT $1 ea, 6 for $5
OIL 4mfd/600WDDC TLA type upright Tubular 4 for $2
MICA CONDSR XMTTNG .006@2500WVDC/5KV Test 7for$1
FILAMENT TRANSFORMER 866A/2.5VCT/10A/7.5KV $2.98
866A Combination 2/tubes 2/ceramic sockets & filament transformer 2.5V/10A/7.5KV SPECIAL! $5.89

"TAB" TERMS: Money Back Gtd. (cost of Mdse. only), $2 min. order F.O.B. N.Y.C. Add Shpg. charges or for C.O.D. 25% Dep. Tubes Gtd. via R-Exp. only. Prices shown are subject to change.

111C Liberty St., N.Y. 6J, N.Y., Rector 2-6245

For further information, check number 31 on page 126.

Letters . . . *[Continued]*

do everything I can to encourage its use for the following reason:

(a) It will tend to eliminate those useless (except for holding up S-meters) screaming nerve wrecking carriers and resultant heterodyne interference.
(b) It will result in the elimination of the present foolish thinking about splattering single sideband stations due to the necessity of using a stable and selective receiver.
(c) It will help the low power fellow to enjoy radio as never before because he will at long last be able to operate on the phone bands during the "best operating hours", enjoy the advantages of voice control and of course enjoy the advantages of receiver selectivity.
(d) Although he will only be able to run half the power that SSB is capable of he will still enjoy the same things that a medium power (500 watt or less) SSB operator enjoys.

I also think that any SSB operator who does anything but encourage his fellow amateur to change from AM to double sideband less carrier should have his head examined . . . may all his troubles be great big fat wooly screaming carriers, hi.

LONG LIVE SIDEBAND, EITHER DOUBLE OR SINGLE, DOWN WITH ALL CARRIERS!

C. L. "Slim" Wilson, W4WQT ex-W5PWO
Clarksville, Tennessee

Dear Wayne,

Enclosed is snapshot demonstrating how to keep XYL out of the way while the OM (me) is erecting antenna.

Works fine, except that the squelch control needs some further work.

Ken Bell, W9OKB
Chicago 31, Illinois

Dear Wayne:

Instead of killing only two birds with one stone, I intend to kill three. First—no doubt you noticed that I included your neat idea (information please) for reader service, or perhaps the first thing you noticed was my subscription for the next two years. The only gripe I have with your magazine Wayne, is that there have not been enough articles on Single Side Band. I'd like to see some practical designs for linear amplifiers in the two to five hundred watt class, driven by a small exciter such as the 10-B or 20-A. Note that I asked for practical designs, for the theory is pretty well covered in both SSB handbooks and other articles—I'm after something to build that doesn't take a lot of time to build, for time is a pretty scarce commodity around here.

Finally, since I've never written in to any magazine

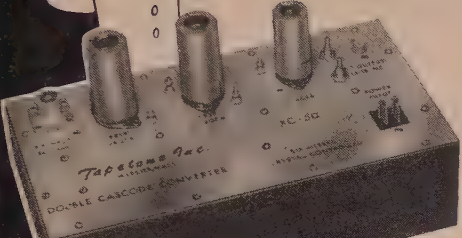
[Continued on next page]

Quality Built

2 AND 6 METER CONVERTERS

XC-144

Two Meter grounded grid 417A Crystal Controlled Converter. 2.8 db Noise figure, 33 db Power gain, 60 db Image rejection, 80 db I. F. rejection and 80 db down on all other spurious responses. XC-144 output 14 to 18 mc.
Price **$79.95**



XC-50

Six Meter Double Cascode Crystal Controlled Converter. 4 db Noise figure, 33 db Power gain, 90 db Image rejection, 80 db I. F. rejection and 80 db down on all other spurious responses. XC-50 output 14 to 18 mc: XC-51 output 10 to 14 mc.
Price **$59.95**

Other Models:

XC-144-C output . .	26 to 30 mc.
XC-144-N output . .	30 to 34 mc.
XC-50-C output . .	26 to 30 mc.
XC-50-N output . .	30 to 34 mc.

Ask your dealer or write to **TAPETONE, INC.**
10 ARDLOCK PLACE, WEBSTER, MASS.

For further information, check number 32 on page 126.

If it's Guaranteed Crystals! We Got'Em!

2015
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SPECIAL FT-243
YOUR CHOICE
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For further information, check number 44 on page 126.

[continued from page 110]

before, even though I've been sorely tempted, I had to call Byron Wels on his statement, "you can see that the complex switching required would demand more than two hands . . . especially if you plan to drive at the same time."

Switching networks for low power rigs are fun to play with, and can be made to do a number of jobs very simply and still only require the use of one hand. Byron Wels described a nice little rig for six meters in the February issue of CQ, but could have made it less expensive and more compatible with the XYL's views on cluttering up the car with additional gear.

Since anyone contemplating this type of rig will doubtless have a broadcast receiver in the car, power is already available. Three switches are necessary in almost any installation that uses a converter in conjunction with the car receiver—filament, antenna, send-receive switches. The switches may be an integral part of the equipment, or may be enclosed in a separate compartment. In either case, the leads should be shielded.

The filament switch S1, serves a dual purpose—it turns on filaments to both converter and transmitter, and transfers the antenna from the broadcast receiver to the converter. S2 re-routes the B Plus from the receiver (taken just after the filter) so that the converter becomes operative. S3 removes B Plus from both receiver and converter and applies it to the transmitter, and at the same time transfers the antenna from converter input to transmitter output.

So we wind up by still having the minimum of three switches with no more than one switch to throw at a time. Although not quite as convenient as push to talk, a positive action toggle switch is safer on the road as it frees a hand or foot, as the case may be, for more important use.

The diagram will show how simply the necessary switching functions of any flea-power rig may be accomplished easily and cheaply — particularly in mobile installations used primarily for local activity, either emergency or rag-chew.

Robert E. Smith, W5VFZ
Las Cruces, New Mexico

Dear Wayne,

I have been trying to get permission to set up shop here in Turkey, but the government prohibits *all* amateur radio transmission. There is one MARS station under NATO in Izmire, but all others are forbidden.

I have several acquaintances who are pushing for a new law, but we could use some good propaganda . . . something to the effect that amateurs provide a nation with trained electronics personnel, etc. Also it might be pointed out that there are few cases (or none) of illegal transmissions in the U. S. that have not been caught or reported by legal amateurs. Anything you can do will be appreciated.

Robert L. Leffert, W0QOJ/TA
TUSAE-JUSMMAT
APO 254, New York, N. Y.

(How about a few of you fellows with connections getting some info to Bob so he can get on the air. Ham radio provides trained operators in time of emergency, natural or otherwise; it interests youngsters in electronics and has in this country had a lot to do with the size of the electronics industry for most of the top men in the industry have been hams for many years . . . many of them first got interested through ham radio; not to be overlooked is the free advertising that a country gets by allowing hams to go on the air and talk about the country. Hundreds of U. S. Hams visit their foreign friends every year . . . ed.).

Dear Wayne:

I am still receiving requests for the type of condenser to use in the modification of the DX-100 October 1956 CQ, Page 34. (Over 40 letters and cards to date.)

Will you pease publish a note to advise that the proper condenser can be obtained from most jobbers by asking for J. W. Miller (Coil Co.) catalogue #2113, 3 gang, 365 MMF per section and lists for $5.00. It will then be necessary to remove the small padders on each section.

Cordially,
Lloyd Jones, W6DOB

Shoes *[from page 37]*

10-B owners should note that the 15 mc traps can be removed.

Fig 5 shows the new final amplifier circuit. The bias potentiometer is mounted between the telephone relay and the filter condenser (see photograph). A longer shield was made to better shield the 6146's from the 6AC7. A VR-150 is mounted in the old QT-1 socket. A separate power supply capable of giving 600 volts at 200 ma. under load is external to the unit and powers the 6146's via the accessory socket. See *fig 6*.

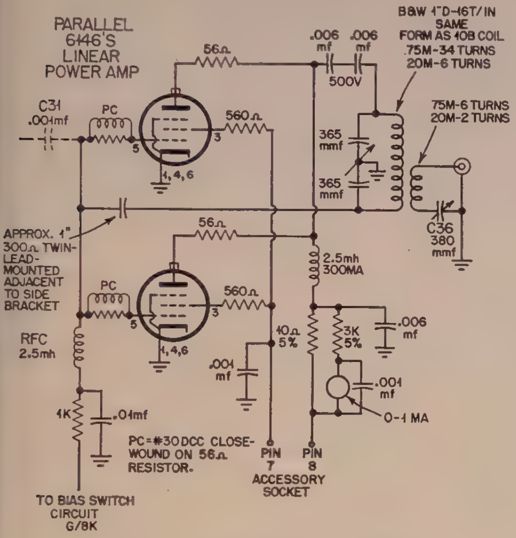
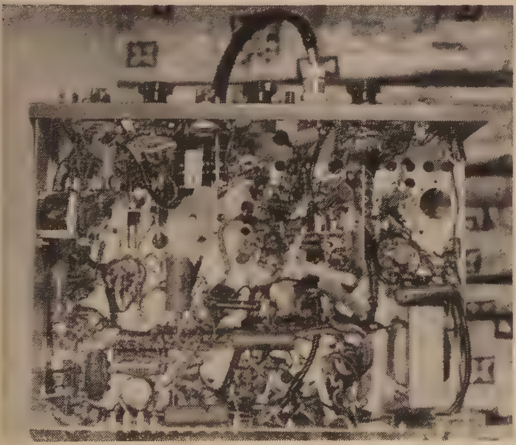

PARALLEL 6146'S LINEAR POWER AMP
C31 .001mf
PC
56Ω
560Ω
5
3
1,4,6
.006 mf
.006 mf
500V
B&W 1"D-16T/IN SAME FORM AS 10B COIL 75M-34 TURNS 20M-6 TURNS
75M-6 TURNS 20M-2 TURNS
365 mmf
365 mmf
C36 380 mmf
APPROX. 1" 300Ω TWIN-LEAD-MOUNTED ADJACENT TO SIDE BRACKET
2.5mh 300MA
RFC 2.5mh
10Ω 5%
3K 5%
.006 mf
.001 mf
.001 mf
0-1 MA
4K
.01mf
PC=#30DCC CLOSE-WOUND ON 56Ω RESISTOR.
PIN 7
PIN 8
ACCESSORY SOCKET
TO BIAS SWITCH CIRCUIT G/8K

Fig 5. Modified final amplifier.



Underside of modified transmitter.

The whole rig should cost about $100 and give you 100 watts on single sideband . . . which compares favorably with the going price for such commercial units of $400 to $500. ■

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For further information, check number 35 on page 126.

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For further information, check number 39 on page 126.

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LOS ANGELES 18, CALIFORNIA

For further information, check number 36 on page 126.

Standard

[*from page 55*]

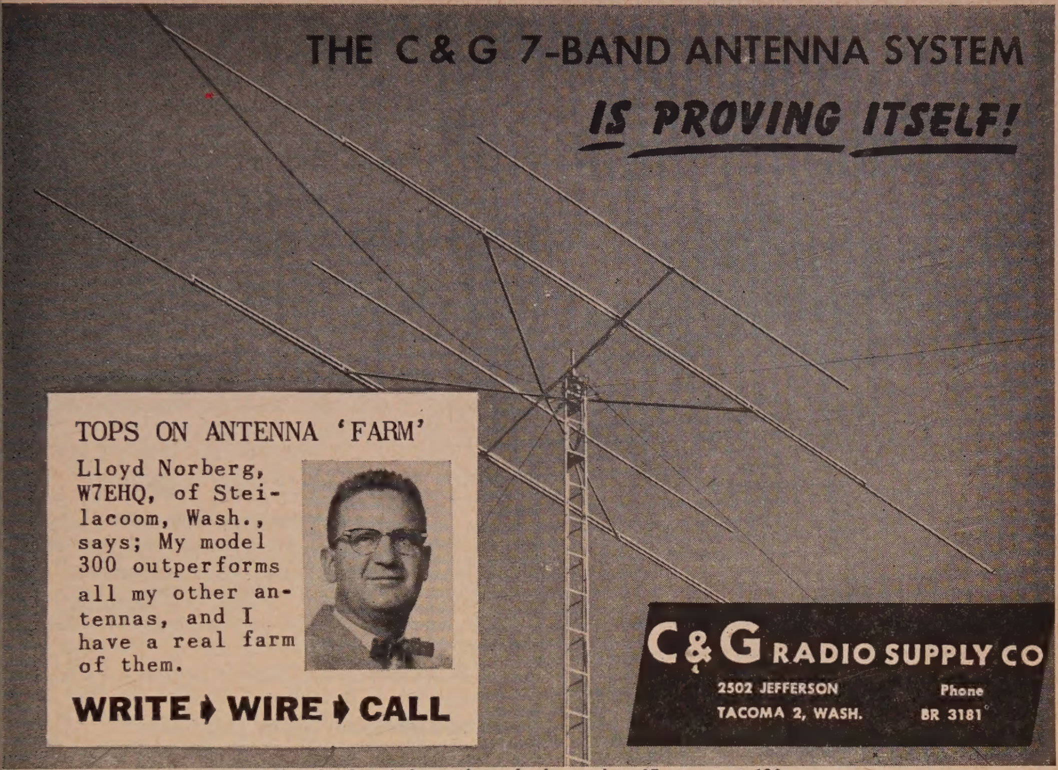
down to make a snug fit when everything is pulled up plumb. This takes a little time and patience, but the resulting rigidity is well worth the effort. The panel holds the chassis deck scurely at the front. A dome-type pilot light, using a neon lamp, is mounted on the top of the box where it will be visible from every direction. Front panel controls are the power "ON-OFF" switch and an opening in the panel through which *C3* is adjusted with an insulated screwdriver. Normally this opening is neatly closed with a snap-in hole plug. A screen door pull makes a convenient handle.

Calibration

Calibrating the frequency standard is simplicity itself. Just turn on the standard, let it warm up for ten or fifteen minutes, then turn it off and, very carefully, tune in WWV on your receiver at, say, 5 megacycles. Turn the standard on again, remove the hole plug from the "CALIBRATE" opening in the panel and insert an insulated screwdriver. When the carrier of WWV is unmodulated, rotate the screwdriver, and thus the rotor of capacitor *C3*, until the standard zero-beats with the carrier. Zero beat is indicated by a very slow back and forth movement of the needle of your receiver's "S"-meter or a very slow rise and fall in the background noise in the speaker or headphones.

Best sensitivity in zero-beating will be obtained when the signal output from the standard is about the same strength as the carrier from WWV. To set the levels, first turn off the standard and then tune in WWV. Note the carrier level on the "S"-meter. Now, without touching any of the other controls, tune the receiver to a clear channel about 500-kilocycles higher or lower in frequency, turn on the standard, and touch up the tuning of the receiver for maximum "S"-meter reading when receiving the standard. Move the standard toward or away from the receiver, as needed, until the "S"-meter reading is the same as that obtained when receiving WWV. Retune the receiver to WWV and adjust the standard for zero beat as previously described. From then on, signals will be obtained from the standard at exactly every 500 kilocycles, from 500 kilocycles to at least 30 megacycles.

A frequency standard like this is very useful for chcking the calibration of your receiver, signal generator, V.F.O., frequency meter, grid dip meter, or almost any device that generates, or is calibrated to receive, radio-frequency signals. Keep in mind, though, that while any such standard gives you signals at exactly 500-kilocycles intervals, it has no means of telling you to which 500-kilocycle interval you are tuned. Thus it must be used with an instrument which is at least roughly calibrated to within 500 kilocycles at any rate. Your station receiver, if it has not been tampered with,



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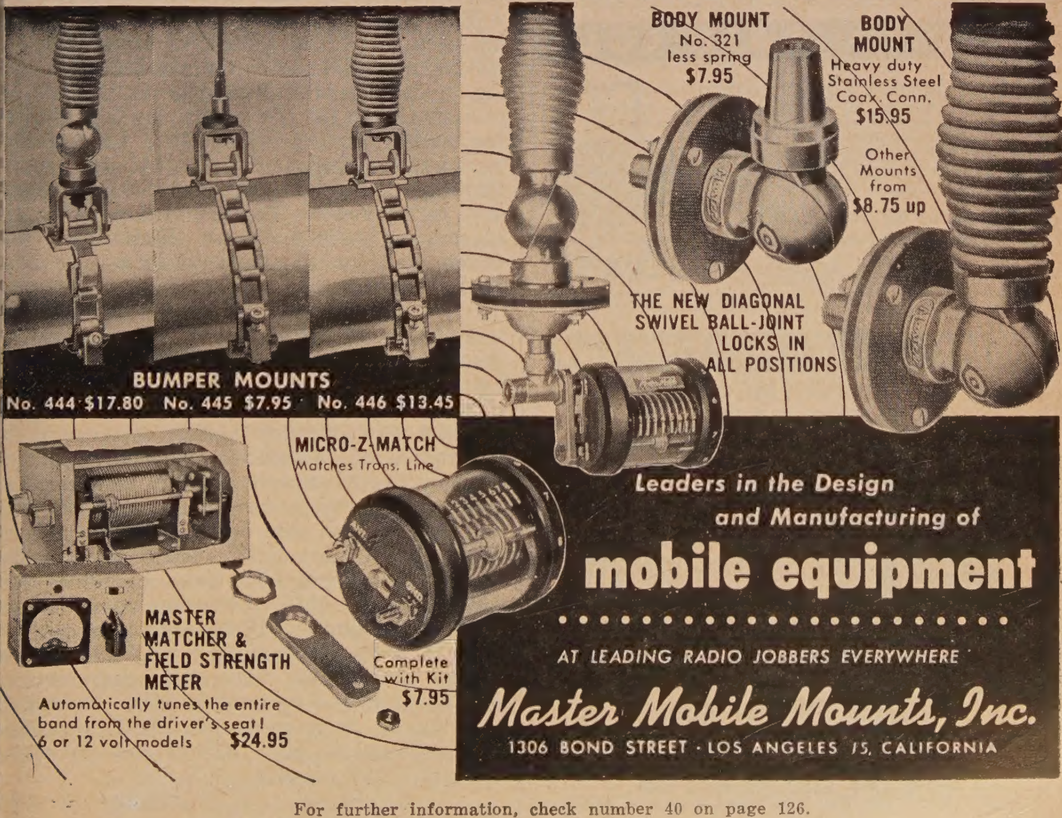
For further information, check number 37 on page 126.



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For further information, check number 40 on page 126.

The **PALCO**
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The smallest, most compact
MOBILE TRANSMITTER with
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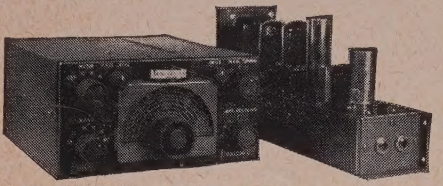

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For further information, check number 38 on page 126.

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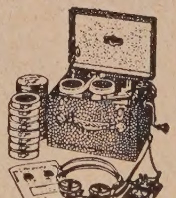

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fills this requirement very nicely. Further information on the use of standards will be foun in any of the radio handbooks.

If you're looking for maximum accuracy a minimum cost, and for ease of construction— mister, this standard is it!

Scratchi [*from page 8*]

with rig in car—hmmmm. Maybe better letting hole thing go. If I figyouring out sistem at least I'll be able to drive thru Los Angelee without hitting Hon. Red Lite.

Respectively yours
Hashafisti Scratch

[*Continued from page 51*]

You Are Forbidden To Read This

1. **Doherty** (if you knew it you spelled it wrong) 2. **Armstrong** (DeForest passes, if you want to argue about it); 3. **Wheatstone**; 4. **Foster-Seely**; 5. **Clapp** 6. **Pierce**; 7. **Meissner**; 8. **McIntosh** (what? You're not a hi-fi'er?); 9. **Colpitts**; 10. **Wien**; 11. **Williamson** (more hi-fi); 12. **Hartley**; 13. **Jones**; 14. **Ohm** (with credit fo Kirschoff); 15. **Heising.**

Propagation [*from page 81*]

propagated signal to drop in intensity from S- plus to zero in a matter of a few minutes.

The occurrence of sporadic-E propagation has been studied for some time but its cause i still unknown. Since it occurs more often during the daylight hours, it appears that ultraviole radiation from the sun might play a part in it formation. On the other hand, since it als occurs quite often at night, especially in pola regions, some other source of ionization mus also be responsible for its formation. Recen suggestions point towards ionization fron meteor trails and from auroral displays as othe possible sources.

Since so little is known about the cause o sporadic-E ionization, its behavior cannot b predicted by positive means at the present time Long term statistical studies concerning it characteristics do however tell us that at mid latitudes we can expect a sharp increase in th occurrence of sporadic-E short-skip propagation during June and the summer months, especially during the daytime hours. From *Figur 6* it can be seen that during the next two o three months, sporadic-E propagation over distances up to about 1400 miles should be possible for nearly 60% of the time on 15-meters 35% of the time on 10-meters and about 5% of the time on the 6-meter band. A graph fo further determining the relationship betwee skip distance and sporadic-E MUF, as well a assisting in forecasting sporadic-E opening can be found on page 102 (*Figure 5*) of th January, 1957 column.

73, George, W3AS

DSB adapter

[*from page 33*]

adapter to the center of the receiver i.f. passband to assure equal amplification of both sidebands. The receiver BFO may now be retuned approximately one kc and, with AFC OFF, the INTERFERENCE REJECTION should be set to the position giving the least audio output. Adjust C22 and R67 in succession to null the output. If the alpha and beta circuits were not included, a scope could be used to adjust for 90° phase difference between the "I" and "Q" audio signals (or local oscillator injection). Up to this point the alignment may be compared to that for a "signal slicer." If the interference rejection and SSB reception features are not desired, V7 and V8 should be omitted and audio output taken from R10.

To align the phase detector, the BFO should be OFF and the receiver tuned to an unmodulated carrier so that a one kc beat note is heard. Adjust the receiver r.f. gain to produce about four volts of audio on the plate of the audio amplifier V3b. Short R11 to ground, adjust R15 for dc null at TP1, adjust R16 for dc null at TP2, and adjust R31 for minimum ac voltage at TP3. Remove the short from R11 and adjust R17 for minimum ac at TP3. Turn the receiver AVC ON and advance the r.f. GAIN control. The S meter should move up-scale, but there should be little change in audio output level. The AGC delay voltage is on Pin 8 of V6 and should be about +20V dc. The adapter should now be ready for reception.

In general, the front panel controls of the receiver will perform the same functions as before the coversion. With the receiver AVC ON, and the adapter AFC ON and INTERFERENCE REJECTION at ZERO, an AM station is received by tuning to zero beat. With the constants specified the oscillator will "lock" as the receiver is tuned to within 100 cycles of the center of a DSB signal and undistorted audio will result. If heterodynes cause the oscillator to shift frequency or output is garbled, the phase detector connections and the adjustments should be rechecked. Tuning accuracy will be greater than required on conventional AM receivers but the degree of tuning accuracy necessary for SSB reception will not be required (except when SSB signals are being received). For this small sacrifice in tuning tolerance you will gain: (1) vastly improved phone reception under conditions of selective fade; (2) ability to employ the simple and efficient DSB transmitter (even at VHF); (3) interference rejection; (4) ability to receive DSB, AM, NFM, PM, SSB and CW without gadgets; (5) better performance due to inherent diversity of two sidebands properly received; and (6) eventual heterodyne free ham bands after all have converted to simplified and carrier free transmitters. ■

THE RADIO BOOKSHOP

is disappointed but not discouraged by your ignoring our ad on page 24 last month. Maybe you missed our little gem, or maybe you are a bit harder to part from your cash than we had supposed. Let's try it again.

Electronics Manual for Radio Engineers by *Marcus & Zeluff* $14.00

These two chaps must have been up to all hours of the night putting this book together for it is loaded wirth circuits . . . circuits . . . circuits. 879 pages of circuits! And these are all practical circuits, like forinstance the article on the Remote Tuning of Receivers with Reactance Tubes which makes it possible to tune your receiver from a remote location by means of a small dc voltage. Every Ham will be fascinated by this book. Contents: Antennas, Audio, Circuit Theory, Components, D-C Amplifiers, Filters, Ionosphere, Measurements, Microwaves, Power Supplies, Production, Receivers, Television, Transmission Lines, Transmitters, Tubes, etc. King size 8½ x 11 pages.

Antennas by *John Kraus* (W8JK)....$9.50

553 pages in this one. John is certainly one of the top antenna men in the world today and this book is a crowning effort. Every ham should have this book in his library to help him with his antenna design and tuning problems. It wouldn't hurt to spend few hours using this like a text book and get hep on the basics of antenna engineering. Let's all get behind John and build up his royalties by buying this book.

Vacuum-Tube Circuits and Transistors by *Arguimbau* $10.25

646 pages. Contents: Diodes & Rectifiers, Triodes, Pentodes, & Linear Amplifiers. Transistors & Transistor Linear Amplifiers. Amplitude Modulation, Power Amplifiers, Oscillators, Inverse Feedback, Frequency Modulation, Television, Noise. This book can be understood by beginners, but is a better bet for those with a bit of electronic background. Math is kept to a minimum. 652 illustrations.

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The 866A in the BARRY May ad, which read 50c, should have been $1.50.